

AD-A173 809

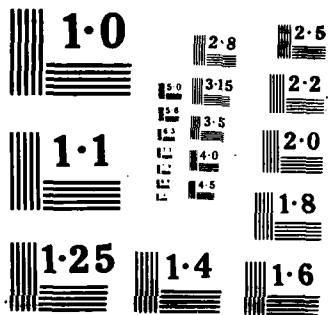
CULTURAL RESOURCES SURVEY OF THE WESTERN SECTIONS OF
THE LAROSE TO GOLDEN (U) GOODWIN (R CHRISTOPHER) AND
ASSOCIATES INC NEW ORLEANS LA E C POPLIN ET AL

1/2

UNCLASSIFIED

18 SEP 86 COELMN/PD-86/14 DACM29-84-D-8829 F/C 5/6

NL





CULTURAL RESOURCES SERIES
Report Number: COELMN/PD-86/14

AD-A173 809

**US Army Corps
of Engineers**
New Orleans District

2

**CULTURAL RESOURCES SURVEY OF THE
WESTERN SECTIONS OF THE LAROSE TO
GOLDEN MEADOW HURRICANE PROTECTION
PROJECT, LAFOURCHE PARISH, LOUISIANA**

FINAL REPORT

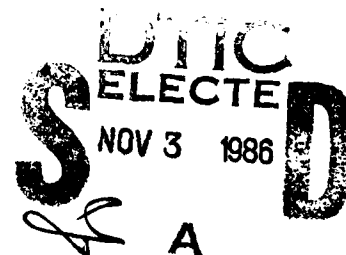
SEPTEMBER 18, 1986

**R. Christopher Goodwin and Associates, Inc.
1306 Burdette Street
New Orleans, Louisiana 70118**

DTIC FILE COPY

Prepared for
**U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267**

Unclassified. Distribution is unlimited.



86 11 3 028

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER COELMN/PD-86/14	2. GOVT ACCESSION NO. AD-4173809	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) A Cultural Resources Survey of the Western Sections of the Larose to Golden Meadow Hurricane Protection Project, Lafourche Parish, Louisiana		5. TYPE OF REPORT & PERIOD COVERED Final Report
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Eric C. Poplin, Kenneth G. Kelly, Donald Bascle, and R. Christopher Goodwin		8. CONTRACT OR GRANT NUMBER(s) DACW29-84-D-0029 Delivery Order No. 16
9. PERFORMING ORGANIZATION NAME AND ADDRESS R. Christopher Goodwin & Associates, Inc. 1306 Burdette St., New Orleans, LA 70118		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Dept. of the Army, Corps of Engineers, New Orleans District, P.O. Box 60267 New Orleans, LA 70160		12. REPORT DATE September 18, 1986
		13. NUMBER OF PAGES 93
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Same		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Unclassified: Distribution is Unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) Same		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
Acadians	Delta Environments	Lafourche Parish
Archeology	Deposition	Larose
Boudreaux Site (16 LF 99)	Geomorphology	Louisiana
Bayou Lafourche	Golden Meadow	Marsh
Chitimacha Indians	History	Mississippi Delta Complex
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
<p>This report presents the results of the cultural resources survey of the western sections of the Larose to Golden Meadow Hurricane Protection Project area in Lafourche Parish, Louisiana. The investigations consisted of an intensive pedestrian and boat survey of Section A West, Sections B North and South, and Sections C North and South.</p>		

No. 19. Continued

Mississippian Period
Natural Levee
Plaquemine Period
Prehistory
Shell Midden

No. 20. Continued

The prehistoric sequence in the region includes Troyville-Coles Creek, Plaquemine, and Mississippian Periods. The historic period extends from the earliest European settlement, and is discussed through 1912. Emphasis is placed on the identification of significant geomorphic features as they pertain to site location. Although the surface survey and subsurface testing regime failed to identify any sites within the corridor, one site (16LF99) was visited and tested to determine its size and cultural affiliation.

A1



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

September 2, 1986

REPLY TO
ATTENTION OF

Planning Division
Environmental Analysis Branch

To The Reader:

This report was prepared for the U. S. Army Corps of Engineers, New Orleans District, in order to comply with stipulations contained in a Memorandum of Agreement (MOA) concerning the Larose to Golden Meadow Hurricane Protection Project, Lafourche Parish, Louisiana. The MOA was ratified by the Chairman, Advisory Council on Historic Preservation, in 1984. The cultural resources survey therefore provides the basis for compliance with Federal historic preservation laws.

The investigations discussed in this report complete all cultural resources requirements for the western levee sections of the proposed ring levee. These include Sections A West, B South, B North, C South and C North.

We concur with the Contractor's conclusion that no significant cultural resources will be affected by the proposed project. Although the survey did not record any new archeological sites, this report serves as an excellent source for historic information about the lower Bayou Lafourche area and also provides a concise synthesis of all previous cultural resources work in the area.

Caroline H. Albright
Caroline H. Albright
Technical Representative

Michael E. Stout
Michael E. Stout
Authorized Representative of the
Contracting Officer

Cletis R. Waggoner
Cletis R. Waggoner
Chief, Planning Division

TABLE OF CONTENTS

CORPS LETTER DATED SEPTEMBER 2, 1986.....	3
LIST OF FIGURES.....	6
LIST OF TABLES.....	8
I. INTRODUCTION.....	9
The Larose to Golden Meadow Hurricane Protection Project.....	9
The Cultural Resources Inventory of the Western Levee Sections.....	9
II. THE ENVIRONMENTAL SETTING.....	12
Description.....	12
Section A West.....	12
Section B South.....	12
Section B North.....	14
Section C South.....	14
Section C North.....	14
Geomorphology.....	18
Geomorphic Processes.....	18
Delta Chronology.....	19
Lafourche Complex.....	19
Delta Environment.....	22
Natural Levee.....	22
Fresh Water Swamp.....	23
Marsh.....	24
Intertributary Lakes and Bays.....	25
Environmental Changes in the Project Area.....	25
III. THE PREHISTORIC SETTING.....	26
Aboriginal Culture History.....	26
Tchefuncte Period.....	26
Marksville Period.....	27
Troyville-Baytown Period.....	28
Coles Creek Period.....	29
Plaquemine Period.....	30
Mississippian Period.....	31
A Review of Previous Research.....	32
General Expectations Concerning Prehistoric Sites.....	36
Project-Specific Expectations Concerning Prehistoric Sites.....	39

IV.	THE HISTORIC SETTING.....	41
	Colonial Period.....	41
	Transition Between Colonial and American Period....	43
	American Period.....	43
	Late Nineteenth and Early Twentieth Century	
	Bayou Lafourche.....	46
	Historic Site Expectations.....	49
V.	SURVEY METHODOLOGY.....	51
VI.	RESULTS OF THE SURVEY.....	53
	Section A West.....	53
	Section B South.....	56
	Section C North.....	58
	Section C South.....	62
	Section B North.....	66
	The Boudreaux Site (16 LF 99).....	68
VII.	THE EFFECTS OF PREVIOUS IMPACTS ON	
	 ARCHEOLOGICAL RESOURCE BASE.....	75
VIII.	CONCLUSIONS AND RECOMMENDATIONS.....	78
	Recommendations.....	78
	REFERENCES CITED.....	80
	APPENDIX I:.....	86
	Scope of Services.....	87

LIST OF FIGURES

Figure 1.	Lower Mississippi Valley Division Work, Flood Control General, Larose to Golden Meadow Hurricane Protection Project Map (1983), showing the Project Area.....	11
Figure 2.	Composite of USGS 7.5 minute Golden Meadow, Bay Courant, and Mink Bayou quadrangles, showing Section A West (lower) and Section B South (upper).....	13
Figure 3.	Section of USGS 7.5 minute Golden Meadow quadrangle, showing Section B North.....	15
Figure 4.	Composite of USGS 7.5 minute Golden Meadow and Cut Off quadrangles, showing Section C South.....	16
Figure 5.	Composite of USGS 7.5 minute Cut Off and Larose quadrangles, showing Section C North.....	17
Figure 6.	Deltaic lobes of the Mississippi River (after Kolb and Van Lopik 1966).....	20
Figure 7.	Profile of Auger Test 9, Section A West, Transect 1.....	55
Figure 8.	Profile of auger test conducted wooded chenier in Golden Meadow Park, showing chenier stratigraphy.....	57
Figure 9.	Profile of Auger Test 14, Section B South, Transect 9.....	59
Figure 10.	Profile of Auger Test 1, Section C North, Transect 1.....	61
Figure 11.	Profile of Auger Test 4, Section C North, Transect 6, Locus C.....	63
Figure 12.	Profile of Auger Test 10, Section C South, Transect 1.....	65
Figure 13.	Profile of Auger Test 2, Section B North, Transect 9.....	69

Figure 14.	Sketch map of the Boudreaux site (16 LF 99).....	71
Figure 15.	Profile of Shovel Test 1, Ray 220°, at the Boudreaux site (16 LF 99).....	73

LIST OF TABLES

Table 1.	The Association of Mississippi River Delta Lobes with Prehistoric Periods (after Beavers et al. 1984, Gagliano et al. 1975).....	33
Table 2.	Estimated Areas of Known Sites Near the Project Area.....	38
Table 3.	Synopsis of Transect Data, Sections A West and B South.....	54
Table 4.	Synopsis of Transect Data, Section C North.....	60
Table 5.	Synopsis of Transect Data, Section C South.....	64
Table 6.	Synopsis of Transect Data, Section B North.....	67

CHAPTER I

INTRODUCTION

This report presents the results of a cultural resources survey of the Larose to Golden Meadow Hurricane Protection levee right-of-way in Lafourche Parish, Louisiana. This survey was undertaken pursuant to Delivery Order 0016 of Contract Number DACW29-84-D-0029, for the New Orleans District, Corps of Engineers, during June and July, 1986.

The Larose To Golden Meadow Hurricane Protection Project

The Larose to Golden Meadow Hurricane Protection Project will consist of the construction of a hurricane protection levee paralleling Bayou Lafourche between Larose and Golden Meadow, Louisiana. While portions of this ring levee have been constructed to date, the western portion of the facility is scheduled for immediate construction activities. The archeological examination of these areas to assess previous and future impacts to the archeological resource base within the project area is reported herein pursuant to Delivery Order 0016 of Contract Number DACW29-84-D-0029.

The Larose to Golden Meadow Hurricane Protection Project, approved by Congress in 1965, involves the construction of a ring levee around the highly developed residential and commercial areas parallel to Bayou Lafourche between the towns of Larose and Golden Meadow in Lafourche Parish, Louisiana. This levee is designed to protect these areas from storm tides and hurricane floodwaters. Hurricane protection activities involve the enlargement of three miles of existing levees, the construction of 38 miles of new levees, the construction of eight miles of low interior levees, and the construction of two major floodgates in Bayou Lafourche and of several flapgate drainage culverts. Project construction began in 1975; completion is scheduled for 1994. All first lift levee construction on the western side of Bayou Lafourche, with the exception of the extreme northern section (Section C North), already has been completed. Figure 1 displays the project area with the specific levee sections delimited.

The Cultural Resources Inventory of the Western Levee Sections

Prior to initiation of the cultural resources project under consideration here, cultural resources inventories were completed for a number of discrete segments within the larger project area. These areas include Section A East and Section F (McIntire et al. 1981), Section E South (Ryan and Hicks 1984), the Golden Meadow

Floodgate (Rader 1978), the Larose floodgate (Stout and Muller 1983), the Section B North/Section B South Gap Closure (McCullough 1984), and alternate levee alignments on the eastern side of Bayou Lafourche (Gibson 1978). This report presents the results of archeological survey of the portions of the project west of Bayou Lafourche (Sections A West, B North, B South, C North, and C South), as conducted by R. Christopher Goodwin & Associates, Inc. during June and July, 1986.

As stated above, portions of the project area west of Bayou Lafourche have experienced prior impacts as a result of first lift levee construction. Thus, the survey effort described here is intended to provide an assessment of the potential for impacts to the archeological resource base which may have resulted from the previous construction, or that will result from second lift levee construction within these sections. The survey of Sections A West, B South, B North, and C South (Figure 1), where first lift levee construction has taken place, is limited to a corridor 50 feet (15.24 meters) wide adjacent to the protected side of the existing borrow areas and any land remnants within these borrow areas. In Section C North (Figure 1), where no previous project-related construction has taken place, the entire project right-of-way (a corridor 300 to 350 feet, or 91.44 - 106.68 meters wide) has been examined. The results of this survey provide the basis for discussions of previous project-related impacts elsewhere within the project corridor, and potential project-related impacts within previously undisturbed portions of the project area.

In the sections that follow, the environmental setting with respect to the specific project corridor and its relationships to the geomorphic development of the region are described. Chapter III provides a summary of the prehistory of Lafourche Parish, a review of previous research near the project area, and expectations concerning the potential for prehistoric sites within the project corridor. A summary of the historic development of the area along Bayou Lafourche with particular emphasis on expectations concerning the potential for historic sites is presented in Chapter IV. Chapter V describes the methodology employed to examine the project corridor. The results of the survey are described in Chapter VI. Previous and potential impacts to the archeological resource base of the project area and their effects on this resource base are described in Chapter VII. Chapter VIII presents the conclusions of this study with respect to predictive statements concerning prehistoric and historic utilization of the project area.

CHAPTER II

THE ENVIRONMENTAL SETTING

Description

The Larose to Golden Meadow project area under consideration here consists of five discrete engineering sections. These five sections, Section A West, Sections B South and North, and Sections C South and North, all lie to the west of Bayou Lafourche. They extend from south of the town of Golden Meadow northward to the town of Larose. The following discussions describe this area with respect to each section.

Section A West

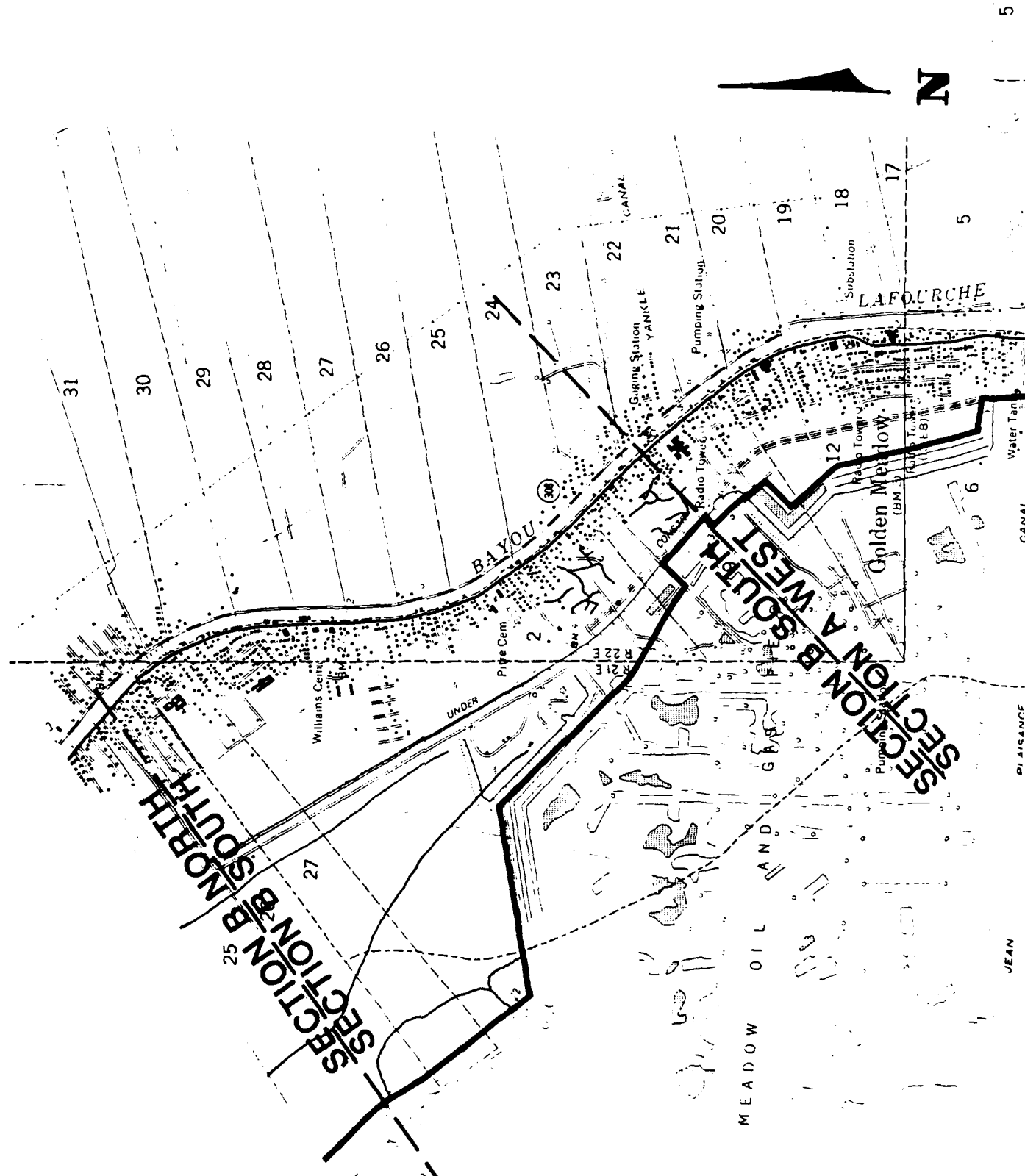
Section A West begins at a point approximately 200 meters west of Bayou Lafourche, 3.9 kilometers south of Golden Meadow. To the north, the section ends at the point where Louviere Lane intersects the right-of-way at the existing levee (Figure 2). The ground surface in this area is below the five-foot (1.52 meters) contour mark. Along the bayou bank, the natural levee is dry. West of the natural levee, the terrain was marshland until the parish levee system was built in the 1960s. Since that time, the terrain in this vicinity has become drier.

The survey area lies to the east or protected side of borrow ponds resulting from first lift construction. The impact corridor in this section is 50 feet (15.24 meters) wide; it is adjacent to the protected side of the existing borrow areas, and to the land remnants within these borrow areas. The area supports marsh grasses in wetter areas and pasture grasses in cleared areas. Additionally, the area is interspersed with occasional stands of wooded land. Many drainage canals dissect this section at varying intervals.

Section B South

Section B South has its southern origin at the point where Louviere Lane intersects the levee, abutting the end of Section A West. The northern end of Section B South is at the point where West 216th Street meets the existing first lift levee (Figure 2). This section is approximately 3.6 kilometers long, running along the east and north edges of the Golden Meadow Oil and Gas Field.

The entire ground surface of Section B South also is below the five-foot (1.52 meters) contour. The Golden Meadow 7.5 minute quadrangle indicates that the entire area encompassed by the section is marshland. After recent levee construction (post-



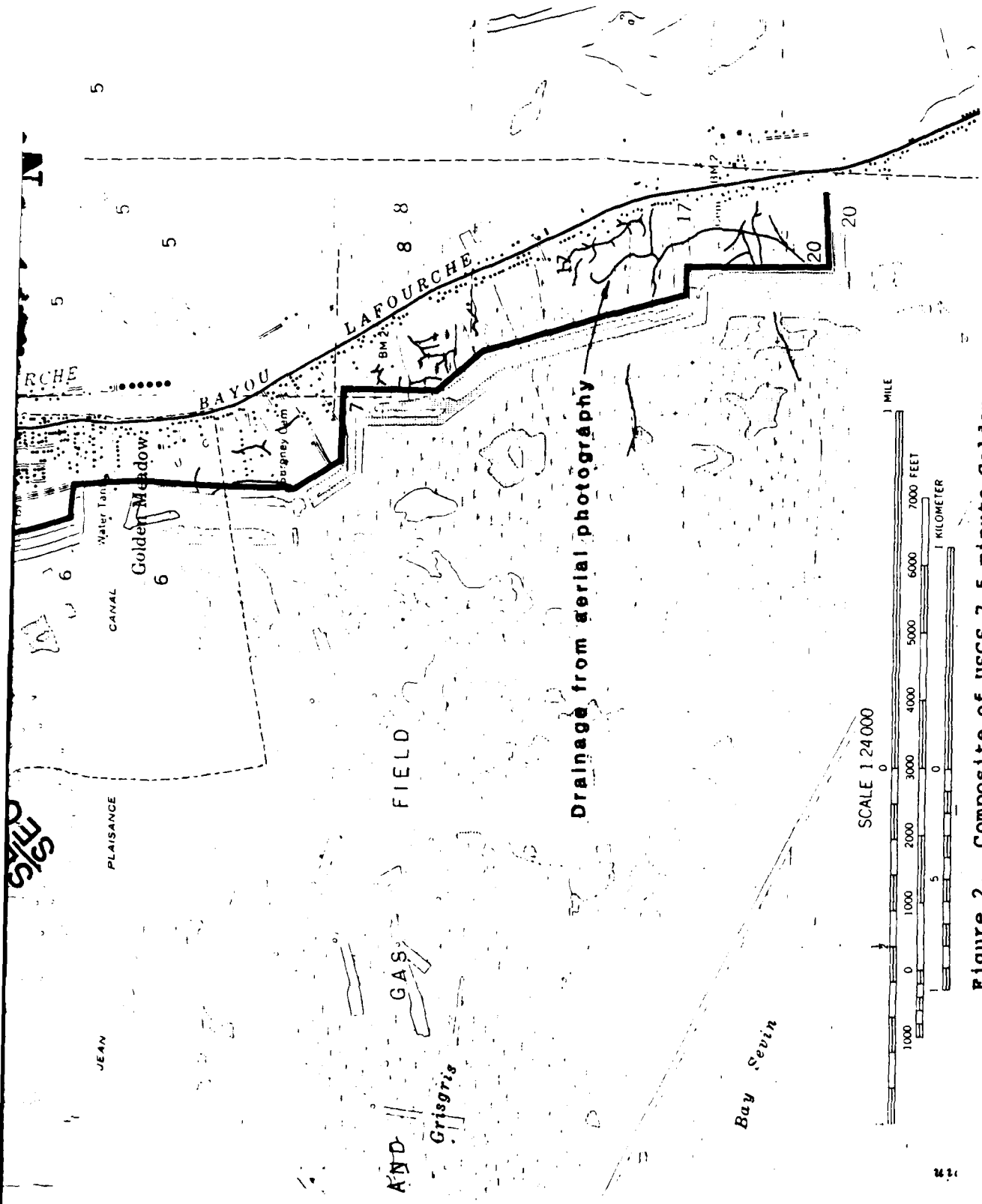


Figure 2. Composite of USGS 7.5 minute Golden Meadow, Bay Courant, and Mink Bayou Quadrangles, showing Section A West (lower) and Section B South (upper).

1960s), the area became somewhat drier. However, numerous drainage canals presently cross the corridor. The nearest habitations indicated on the map in this section of the right-of-way are along the natural levee of Bayou Lafourche at distances ranging from under 0.5 kilometer to over 1 kilometer.

Section B North

Section B North extends from West 216th Street on its southern end to a point approximately 75 meters south of the road just south of the Bully Camp Canal (Figure 3). The total length of this section is approximately 8.2 kilometers. The description of this area is essentially the same as that provided for Section B South. Although the USGS 7.5 minute Golden Meadow Quad shows that this area is completely covered by marshland, parish levee construction during the 1960s dried out the area, making it suitable for pasture. The vegetation of the area is mostly grasses and bloodweed.

Section C South

Section C South consists of approximately 6.3 kilometers of levee right-of-way, beginning at the point where Section B North ends, and having its northern terminus at a point approximately 600 meters south of the intersection of the levee right-of-way and the unimproved road from Cut Off School (Figure 4). This entire section is shown as marshland on relevant topographic maps. However, levee construction has drained the section enough to allow its use as pasture. The exception to this present land use profile is the southernmost portion of the section, northeast of Bully Camp Oil Field and southwest of Belle Amie, which has been extensively cut with sizeable canals. No apparent attempt at reclamation has been made.

Section C North

Section C North consists of a wider survey corridor, 300 feet (91.44 meters) wide in the southern portion and 350 feet (106.68 meters) wide in the northern portion. This section runs north from the point 600 meters south of the Cut Off School road where Section C South ends. The northern end of Section C North is at a point approximately 650 meters southwest of Bayou Lafourche and south of Canal Blue (Figure 5). The Scope of Services defines the survey area in this section as the right-of-way less the existing levee. This area, while primarily marshland, also contains the only part of the survey area above the five-foot (1.52 meters) contour line. This small natural levee is along the southern bank of Bayou Manuel where the levee right-of-way crosses the bayou. The borrow areas for the existing levee are not as flooded as those further south, possibly an indication of slightly greater

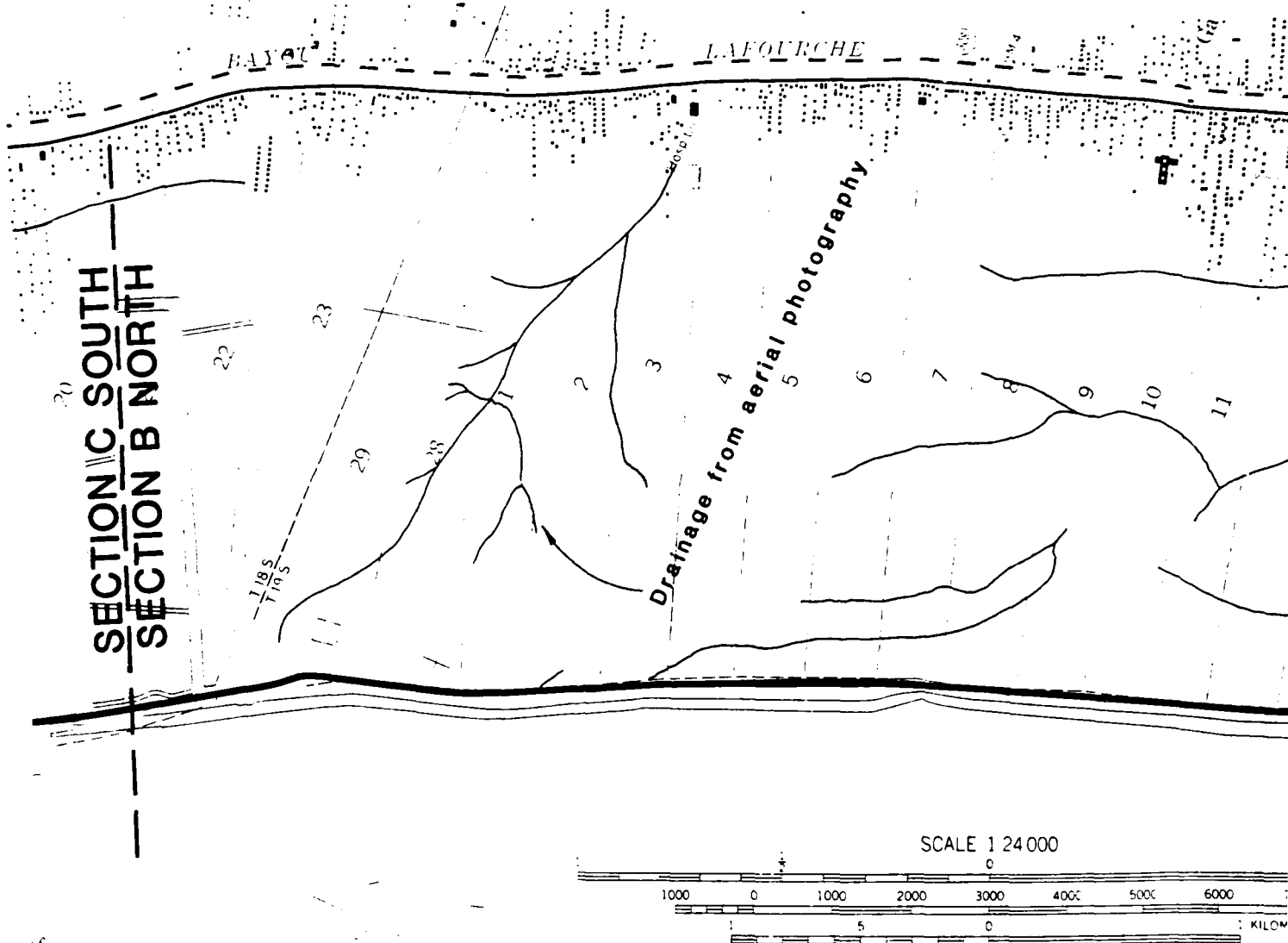
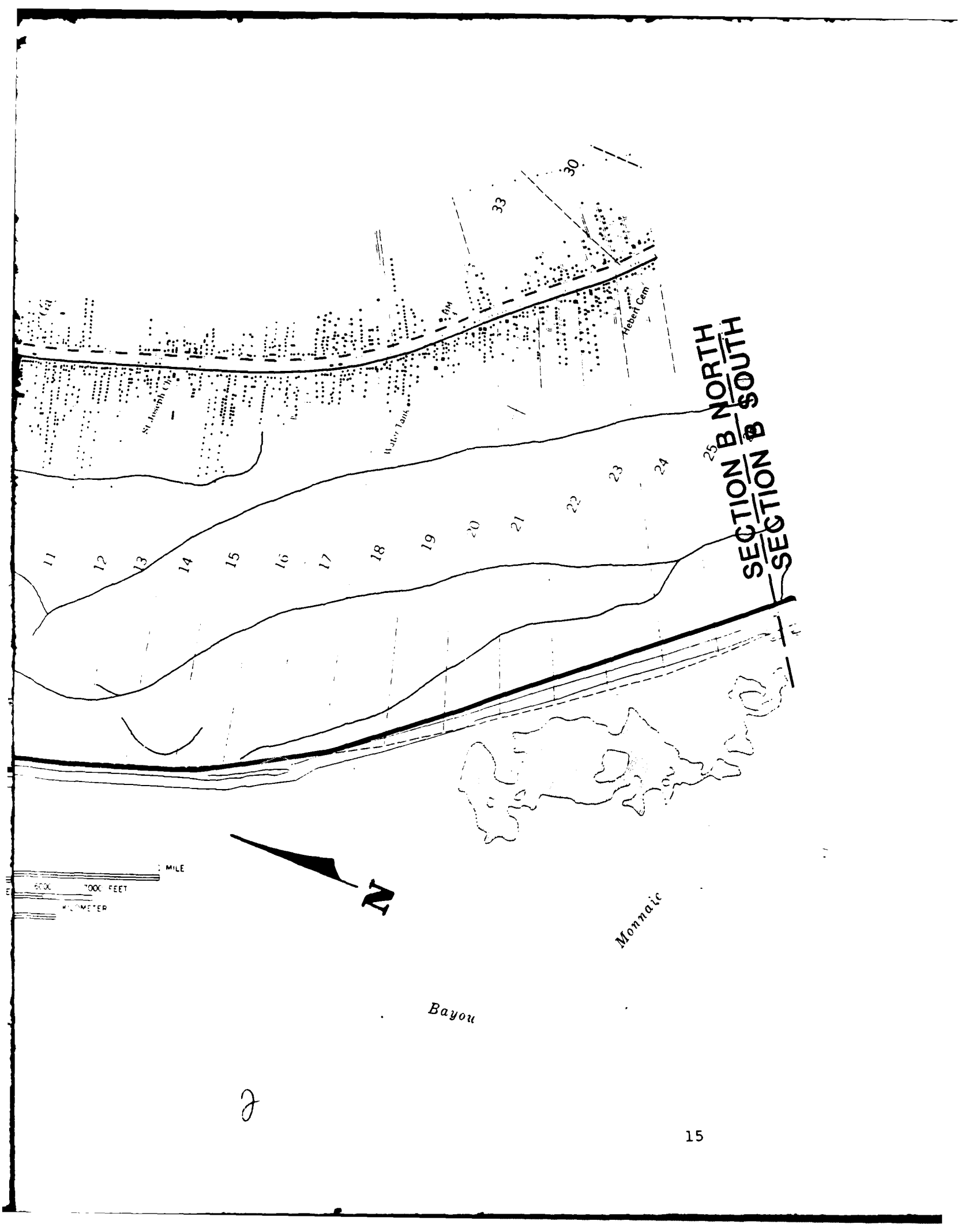


Figure 3. Section of USGS 7.5 minute Golden Meadow quadrangle, showing Section B North.



SECTION B NORTH
SECTION B SOUTH

N

Monnaic

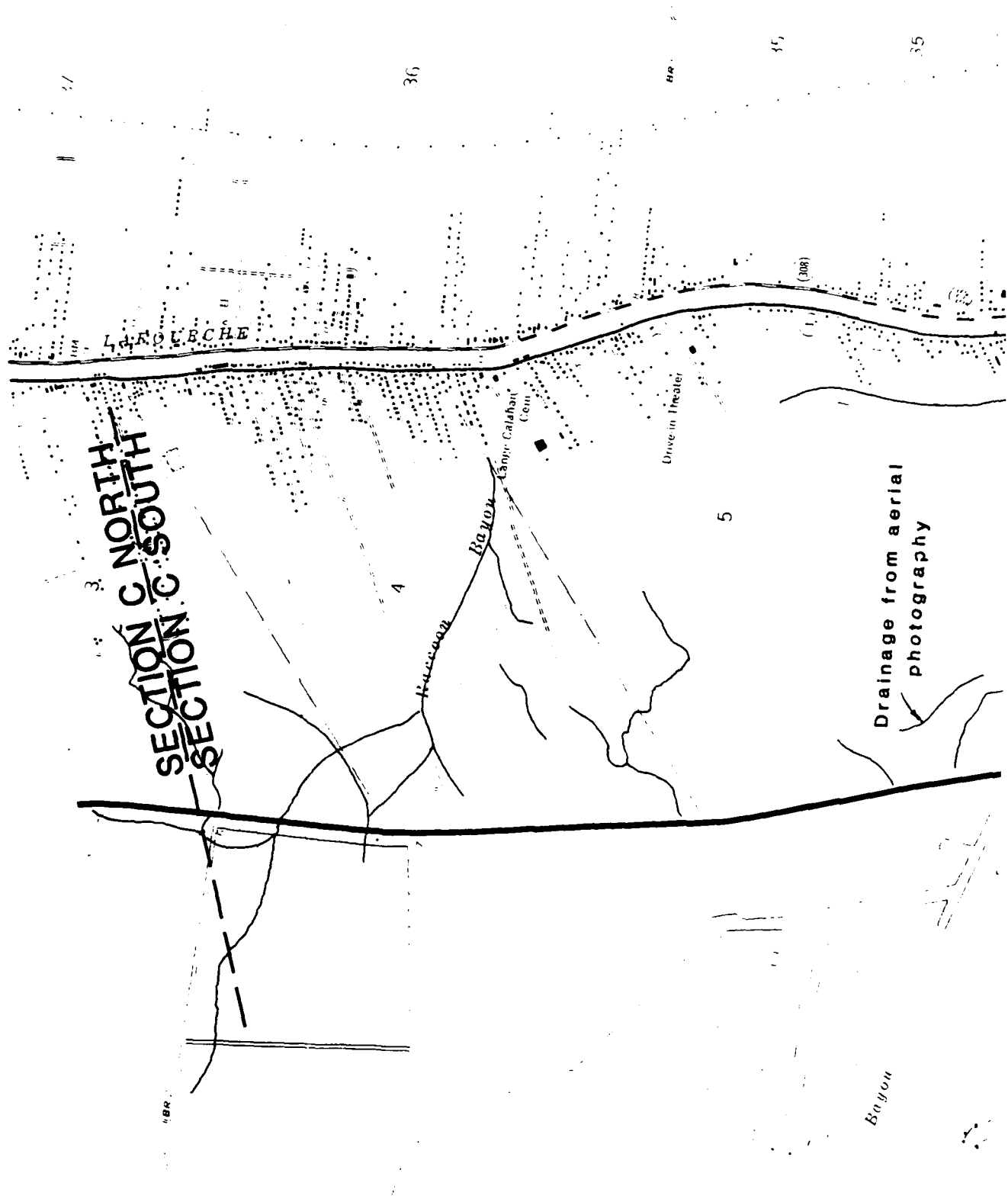
Bayou

MILE

5000 7000 FEET

METER

2



Drainage from aerial
photography

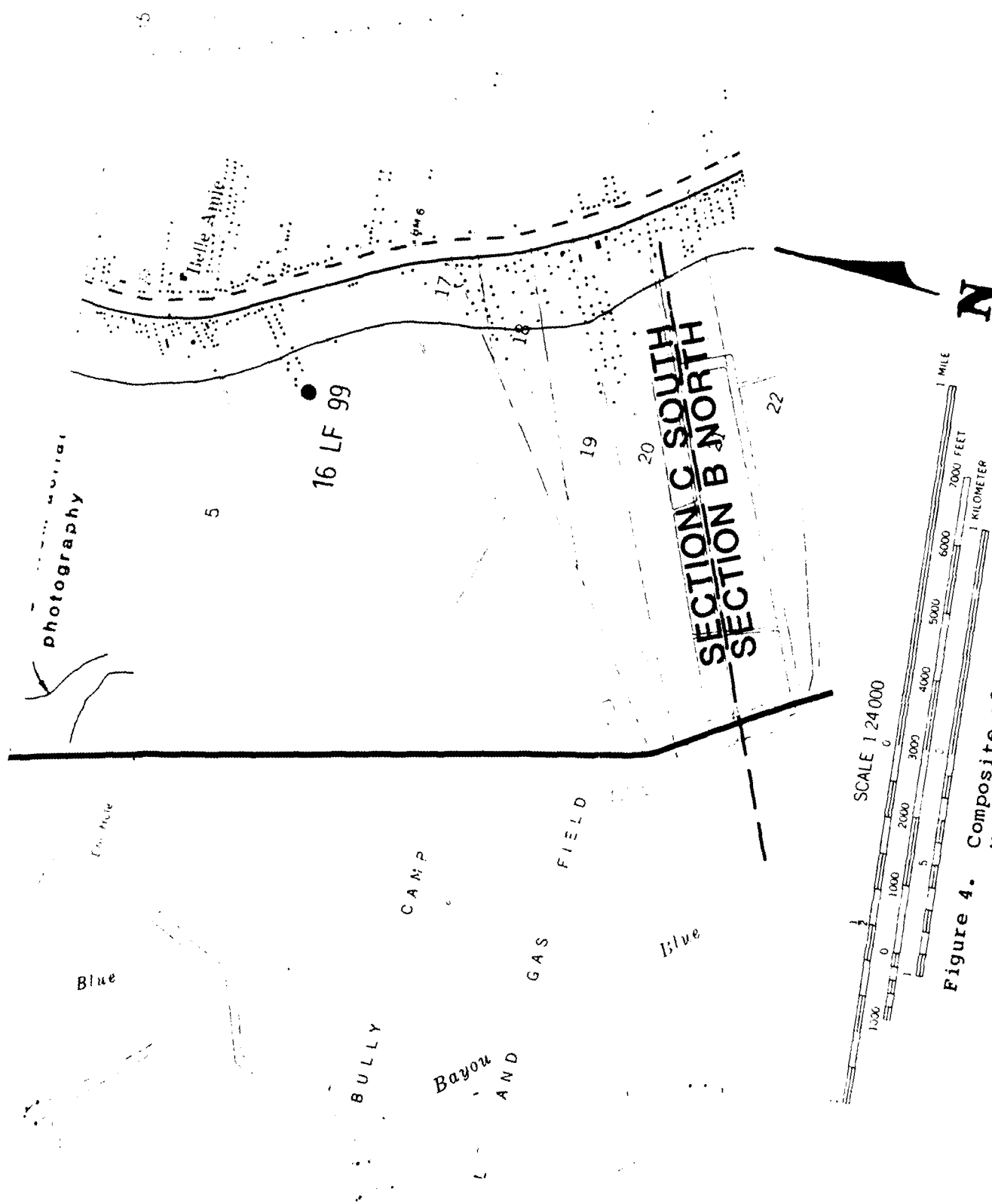


Figure 4. Composite of USGS 7.5 minute Golden Meadow and Cut Off quadrangles, showing Section C South.

104

16 LF 36

62

N

Larose

Larose

Mt Zion Cem

Mt Zion Sch

Drainage from aerial
photography

WATERWAY

BLUE

CANAL

INTRACOASTAL

Hospital Bayou

Hospital

Bayou

Manuel

Tower

46

B

44

3

43

39

68

40

43

42

42

41

25

24

1175
1185

37

38

62

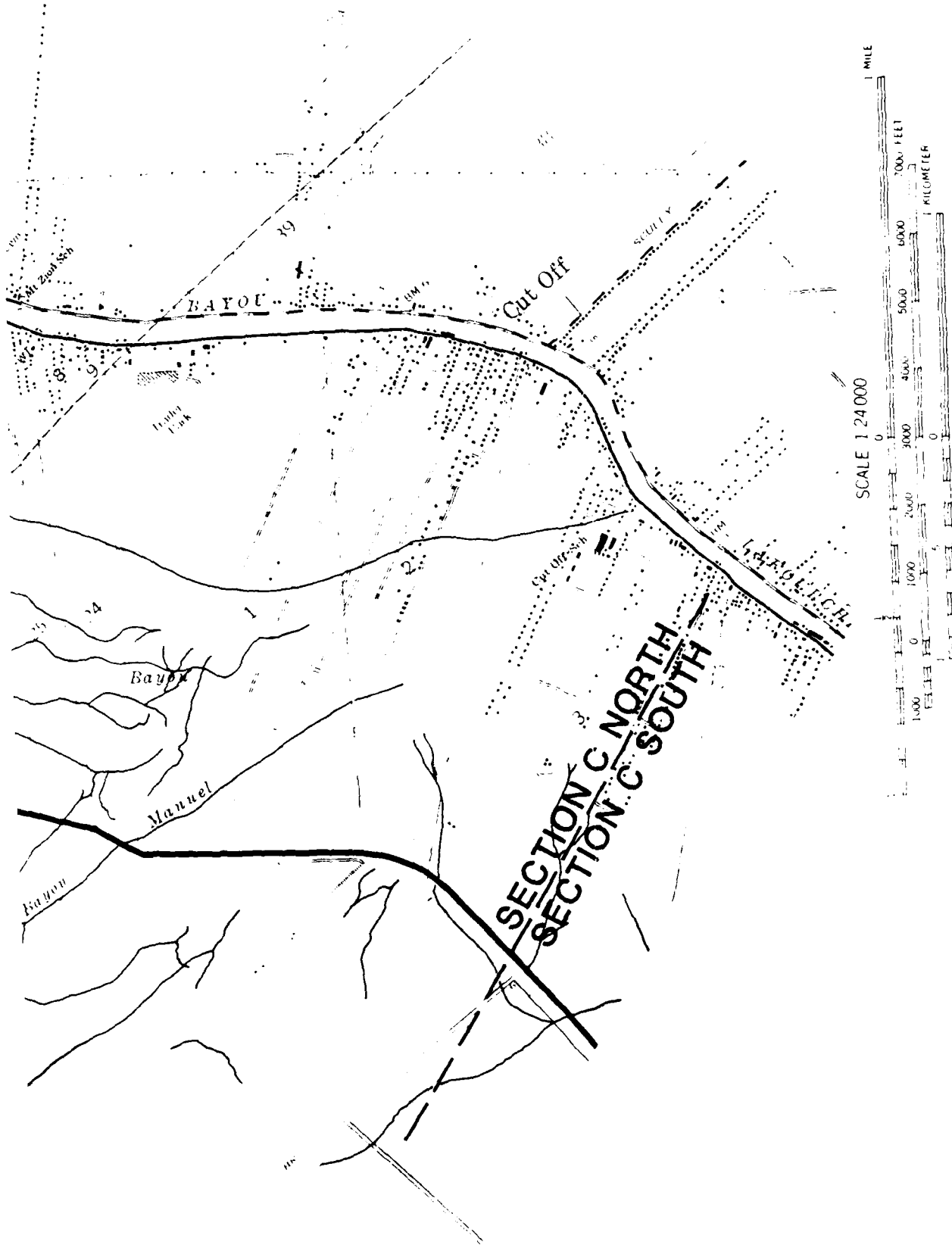


Figure 5. Composite of USGS 7.5 minute Cut Off and Larose quadrangles, showing Section C North.

elevation along much of the project corridor in this segment. Additionally, approximately fifty per cent of the 6.6 kilometer long right-of-way in this section is wooded.

Geomorphology

The Mississippi River deltaic plain is a zone of intensive interaction between fluvial and marine processes. The deltaic plain is composed of at least five discernible delta complexes, each of which has a number of delta lobes or distributory networks. Each delta complex represents a predictable cycle of sedimentation and landscape development. Deposition, subsidence, and erosion cause shorelines alternately to advance and retreat in response to the development of new delta lobes or the abandonment of old lobes respectively. On the coastal plain, where plant and animal communities are highly sensitive to changes in elevation and salinity, changing shorelines and stream patterns can produce changes in the ecology and environment of an area. All of these factors may have major influences on the lifeways of prehistoric and historic populations living in a delta ecosystem.

Geomorphic Processes

The evolution of a delta lobe begins when a course diversion occurs upstream. As the river begins to drop its sediment load into a shallow body of water, subaqueous levee deposits soon restrict its flow to one or more distributaries. Loss of stream velocity causes the coarser sediments to drop out of suspension and form mouth bar deposits. These deposits induce the stream to bifurcate into two or more distributaries. This causes further reduction in stream velocity, which leads to the formation of secondary mouth bar deposits in the distributaries, which in turn forces the distributary into further bifurcation. This multiple bifurcation of distributaries causes continuing loss of velocity in the river's current, allowing some of its suspended load of silt and clay to be deposited ahead of and in between the distributaries. As this material accumulates, shallow bodies of water and intertidal mudflats are created. Along the seaward edge, brackish and saline marshes develop. The inland areas between the distributaries normally develop into fresh water swamps. The natural levees of the distributaries, aggraded by deposits from the river, broaden and gradually slope away into the newly created swamp and marsh. Thus, the delta grows outward into the sea. This process of progradation continues until a new course diversion occurs upstream or the river develops a new distributary complex in another portion of the delta (Frazier 1967).

Upon the cessation of sedimentation, subsidence becomes the

dominant process affecting the delta lobe. When the main flow of the distributary system shifts to another area, the old interdistributary channels begin to silt up. This greatly reduces the rate and volume of new material available for deposition in the now abandoned lobe. With the absence of continual new sedimentation, the vertical accumulation of organic debris in the swamps and marshes of the old interdistributary system cannot keep pace with the normal rate of subsidence in areas of fluvial sedimentation, and a rapid expansion of the lakes and bays contained in the interdistributary area follows. Increasingly stronger marine influences along the coastal plain of the old lobe allow the salinity of inland swamps to increase, causing them to die out. The natural levees of the abandoned distributaries, in the absence of new sedimentation, become narrower and the seaward portions are lost to subsidence. The mainland beaches are reworked into barrier islands which eventually disappear as less and less sediment is available. This sequence of lobe building and abandonment is a continuing process which leads to multiple episodes of lobe formation in the course of building a delta complex (Frazier 1967; Smith et al. 1985).

Delta Chronology

The Mississippi River has experienced at least seven acknowledged episodes of lobe building (Figure 6). The earliest of these was the Lafayette/Sale - Cypremort lobe, which began building approximately 12000 B.P. (Gagliano et al. 1975:36). Around 8500 B.P., a fluctuation in sea level caused a slight shift in the upstream course of the Mississippi which created the Sale - Cypremort pulse of this lobe. The next lobe to form, the Cocodrie, was active between approximately 5000 and 3500 B.P. (Gagliano et al. 1975:41). The sequence continued with the formation of the Teche lobe. According to Gagliano et al. (1975:41-42), the old meander belt of the Sale - Cypremort system was reoccupied by the Teche approximately 2500 years ago. At approximately 2700 B.P., the St. Bernard lobe began its development. Apparently, the Mississippi River utilized two major deltas, the Teche and the St. Bernard, during this period (Gagliano et al. 1975:42). The Lafourche lobe began its major development ca. 1700 B.P. The Lafourche lobe encompasses the present study area; it is discussed in detail below. Around 1000 B.P., the Plaquemine lobe became active. The most recent and still actively prograding delta lobe is the Balize, which began its formation ca. 550 B.P.

Lafourche Complex

Fisk (1944), McIntire (1954), Fisk and McClelland (1959), Coleman and Gagliano (1964), Morgan, Coleman and Gagliano (1963), Gould (1970), Kolb and Van Lopik (1958), Frazier (1967), Gagliano (1975), Gagliano et al. (1979), Weinstein and Gagliano (1984), and

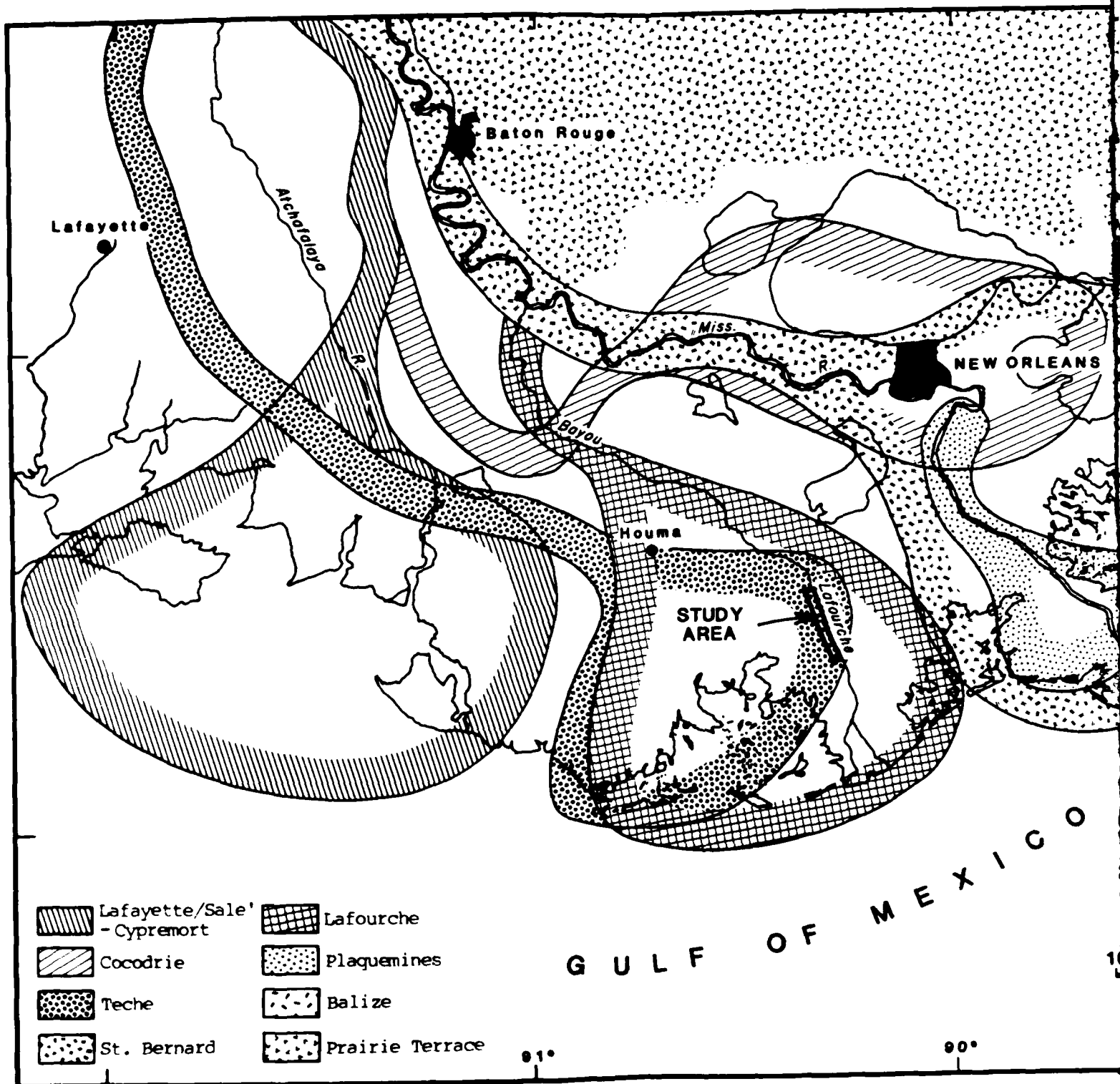
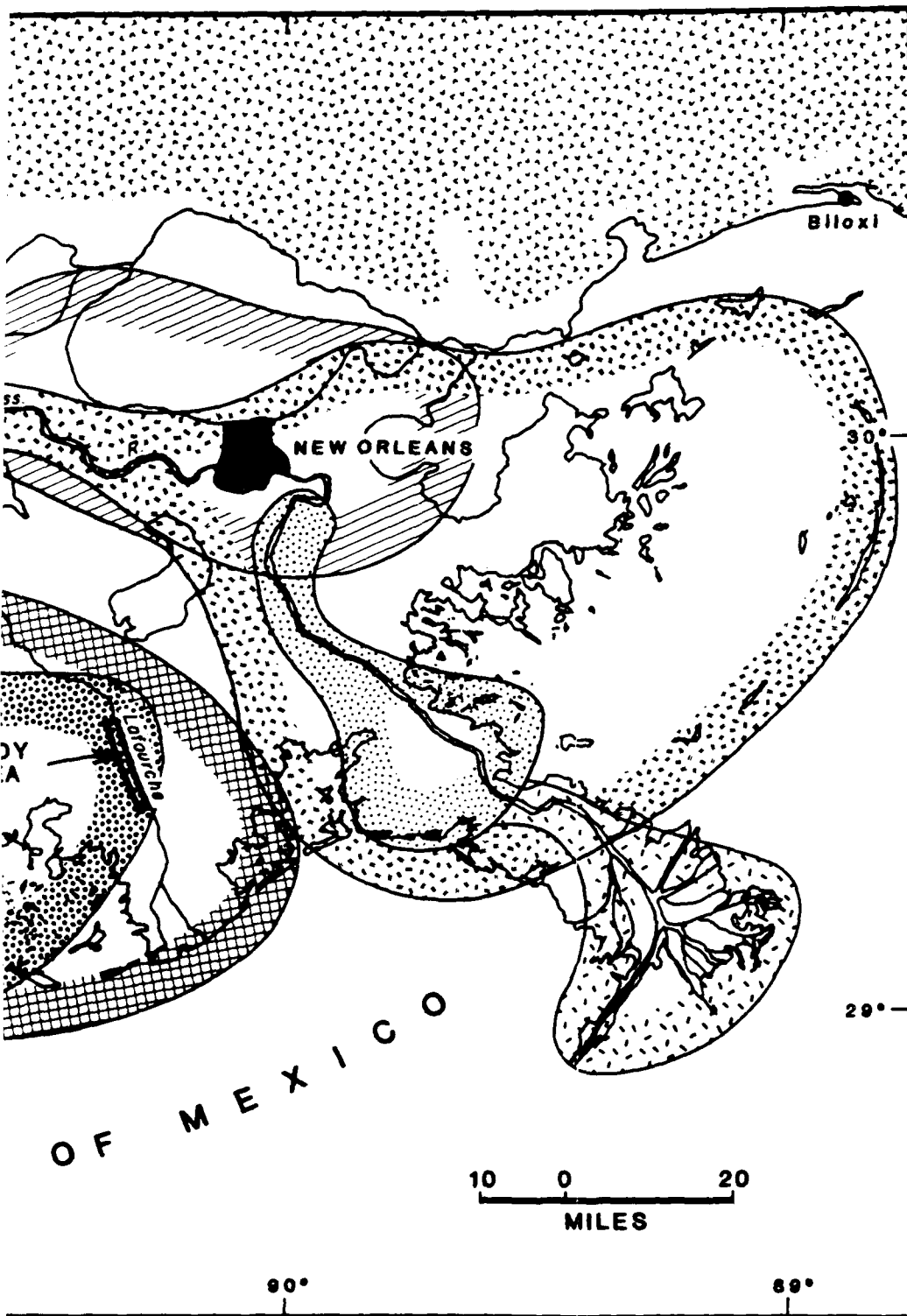


Figure 6. Deltaic lobes of the Mississippi River (after Kolb and Van Lopik 1966).



Smith et al. (1985) have contributed to the reconstruction of the sequence and dating of the various major deltaic episodes. The presently accepted chronology is based on radiocarbon, geological, and archeological data.

While there is general agreement on the gross chronological sequence of the major lobes of the Mississippi delta complex, there is still some debate as to the exact sequence of aggradation within individual lobe complexes which make up the larger whole. Morgan (1974) divided the Lafourche complex into early and late phases. His early phase focused in the west, on the head of passes at Thibodaux and the alluvial fan that extends southward from it. The principal distributaries of this early phase were Bayou Terrebonne, Bayou Little Black, and Bayou Blue. The late phase of the Lafourche lobe focused its activity to the east of Thibodaux, in the Bayou Lafourche drainage area.

Frazier (1967), after examining hundreds of core samples, developed a chronology based on geologic data and radiocarbon tests. Frazier states that the Lafourche lobe was formed in five separate pulses beginning ca. 3500 B.P., with its initial activity focusing around Bayou Terrebonne. Lobe building subsequently shifted in sequence to Bayou Blue, Bayou Black, Bayous Terrebonne and Lafourche, and finally, Bayou Lafourche. Frazier considers the Bayous Terrebonne and Lafourche pulse to have been the most extensive.

Weinstein and Gagliano (1984), after examining geological, geomorphological, and archeological data, hypothesized a different depositional sequence for the Lafourche complex. Echoing Morgan (1974), they divided the lobe building process into separate east and west pulses, with the initial activity taking place to the west of Timbalier Bay. The major distributary of this initial pulse followed the course of Bayou Petit Caillou. In the east, a subsidiary lobe began to develop in the drainage areas of Bayou Raphael, Bayou Ferblanc, and Bayou L'Ours. The sequence of aggradation later shifted to the region of Bayou Grand Caillou and Bayou Terrebonne in the west, and to Bayou Lafourche in the east. The Bayou Lafourche pulse was the most extensive; it built a delta that extended five to ten miles beyond the present limits of land.

From the above, it is obvious that there is not yet a consensus on the sequence of aggradation for the Lafourche complex. There is also disagreement on the placement and age of the major distributary systems involved in its formation. Beavers et al. (1984) favor Frazier's interpretation which is based on data obtained from subsurface core samples and radiocarbon dates. Finding this reasoning to be sound, this report also will utilize Frazier's (1967) reconstruction of the sequence of events which formed the Lafourche lobe of the Mississippi delta complex.

The initial progradation of the Lafourche delta began ca. 5600 B.P. when a stream diversion occurred about 50 miles above Baton Rouge. This allowed the river to flow into an estuary that was located in the eastern portion of the alluvial valley (Frazier 1967). According to Smith et al. (1985), this estuary represented the drowned distal portions of the Teche lobe. A biostratigraphic analysis of deep borings from this area revealed a large assemblage of foraminifera associated with estuarine and shallow marine environments (Smith et al. 1985: 65). However, the Lafourche lobe did not begin to carry the main outflow of the Mississippi until approximately 3500 B.P., at which time the Bayou Terrebonne pulse became active. This area remained active until approximately 2050 B.P. The Bayou Blue pulse, according to Frazier (1967), was the second focus of the Lafourche lobe lasting from ca. 2000 to 1850 B.P. The next pulse in the chronology was the Bayou Black phase which reoccupied the Bayou Terrebonne channel and extended the delta westward in the process. During this westward progradation, the subaqueous distal end of the former Bayou Teche - Mississippi course was incorporated into the building distributary system. The Bayou Black pulse remained active until 1050 B.P. at around which time the Lafourche - Terrebonne pulse began to take dominance. Frazier (1967:301) maintains that the Lafourche-Terrebonne phase was the most extensive of the five pulses that make up this lobe complex, with its most active period commencing ca. 800 B.P. The final pulse of lobe building activity was focused in the area of Bayou Lafourche. The Bayou Lafourche phase prograded the delta southeastward. This lobe remained active from ca. 350 B.P. until the beginning of this century, at which time the headwaters of Bayou Lafourche were dammed at Donaldsonville.

Delta Environment

The deltaic plain is composed of former stream courses, swamps, marshlands, and near-sea level lakes. These sub-environments can be classified as follows: natural levee system, fresh water swamp, fresh/brackish water marsh, and interdistributary bays and lakes. Each sub-environment supports a distinctive biota. This interlocked system is highly sensitive to changes in water salinity and elevation. Alterations in elevation as small as 10 centimeters can cause a dramatic change in these ecosystems.

Natural Levee

Natural levees and levee backslopes form along distributary channels. They are composed primarily of silts deposited by overbank flooding. Levees and their adjacent backslopes

represent the highest areas of land available to flora and fauna for colonization in a delta system. Levees reach their maximum elevations adjacent to the distributary channels, gradually grading down into fresh water swamp.

The levee and levee backslope support a diverse variety of flora and fauna. Mammals such as the white-tailed deer (Odocoileus virginianus), the Eastern cottontail (Sylvilagus floridanus), and the American black bear (Euractos americanus) inhabit these areas. The floral overstory supports many varieties of hardwood trees including live oak (Quercus virginiana), American elm (Ulmus americana), pecan (Carya illinoensis), and hackberry (Celtis laevigata). Some common varieties found in the understory are water locust (Gleditsia aquatica), palmetto (Sabal minor), greenbriar (Smilax rotundifolia), and Spanish moss (Tillandsia usneoides).

Fresh Water Swamp

Fresh water swamps form in the interstitial areas of distributaries, as well as in areas flanking the backslope portions of the natural levees. Fine silts and clays along with organic debris are the aggrading materials in this sub-environment. These low-lying areas retain standing water for at least a portion of the year, with most areas remaining inundated year-round.

This ecotone is also diverse in its floral and faunal components. The floral overstory is dominated by bald cypress (Taxodium distichum) and tupelo gum (Nyssa aquatica), with Virginia willow (Itea virginica) and buttonbush (Cephalanthus occidentalis) also represented. The understory is much more varied and contains alligatorweed (Alternanthera philoxeroides), swamp lily (Crinum americanum), water hyssop (Bacopa monnieri), lizard's tail (Saururus cernuus), fanwort (Cabomba caroliniana), and whorled pennywort (Hydrocotyle verticillata).

Mammalian representatives of the faunal community include white-tailed marsh deer (O. virginianus mcilhennyi), common muskrat (Ondatra zibethicus), American beaver (Castor canadensis), river otter (Lutra canadensis), and the Virginia opossum (Didelphis virginiana). Reptiles and amphibians also are well represented, with the American alligator (Alligator mississippiensis), the bullfrog (Rana catesbeiana), the common snapping turtle (Chelydra serpentina), and the cottonmouth (Agkistrodon piscivorus) being common examples. Large populations of birds also can be found inhabiting areas of fresh water swamp. These include the great blue heron (Ardea herodias), wood duck (Aix sponsa), red-tailed hawk (Buteo jamaicensis), white ibis (Eugocimus albus), and osprey (Randion haliaetus).

Marsh

Beyond the fringes of the fresh water swamps, areas of marsh develop. Marshes can be sub-divided into fresh, brackish, and saline varieties. Each supports different floral and faunal communities. Marshes are characterized as areas of reeds and grasses that perennially retain standing water. The primary materials of sedimentation consist of clays and large amounts of organic materials. The large volume of organic debris produced by a marsh environment results in thick layers of peat being deposited.

All three varieties of marsh are productive areas in terms of biotic life. Fresh water marsh fauna include white-tailed deer (Odocoileus virginianus), mink (Mustela vison), red wolf (Canis rufus), mallard (Anas platyrhynchos), killdeer (Charadrius vociferus), alligator snapping turtle (Macroclemys temminckii), green anole (Anolis carolinensis), banded water snake (Natrix fasciata), alligator (Alligator mississippiensis), and the red swamp crawfish (Procambarus clarkii). Floral species common to the fresh water marsh environment are represented by sea myrtle (Baccharis halimifolia), marsh elder (Iva frutescens), black willow (Salix nigra), rushes (Juncus sp.), switchgrass (P. virgatum), southern cattail (Typha domingensis), and giant cutgrass (Zizaniopsis miliacea).

On the seaward side of the fresh water marsh is the brackish marsh. This is where the fresh water from inland areas meets the inflow of intrusive water from the sea. A state of relative equilibrium between salt and fresh water is maintained, creating large areas of brackish marsh. The brackish marsh is one of the most productive areas of the delta system. It is in this type of marsh that the brackish water clam (Rangia cuneata) thrives. This mollusc provided an economic base for numerous aboriginal groups in the southeast. Other members of the biotic community include the double crested cormorant (Phalacrocorax auritus), mottled duck (A. fulvigula), American avocet (Recurvirostra americana), muskrat (Ondatra zibethicus), pig frog (Rana grullio), diamond-backed water snake (N. rhombifera), blue crab (Callinectes sapidus), oyster (Crassostrea virginica), stinkpot (Sternotherus odoratus), rattlebox (Sesbania texana), sea oxeye (Baorrichia frutescens), saltwort (Batis maritima), spikerush (Eleocharis sp.), black rush (Juncus roemerianus), and pink hibiscus (Kasteletzkya virginica).

The salt water marsh is found on the seaward edges of the prograding delta, where marine influences dominate. Members of the salt marsh biotic community include white-tailed deer, river otter, mink, raccoon, frigate (Fregata magnificens), snow goose

(Chen caerulescens), pintail (A. acuta), diamond-backed terrapin (Malaclemys terrapin), river cooter (Chrysemys concinna), blue crab, oyster, black mangrove (Avicennia germinans), sea myrtle, saltgrass (Distichlis spicata), saltmarsh fimbristylis (fimbristylis castanea), sea-purslane (Sesuvium sp.), and sea blite (Suaeda tinearis).

Intertributary Lakes and Bays

The shores of intertributary lakes and bays have produced a significant clustering of prehistoric sites in the Lafourche delta system (Smith et al. 1985:72). These ecotones were important locations for various prehistoric populations, providing abundant resources and easy access to the intertributary waterway system. The lakes and bays supported a variety of edible plants and animals including wood duck, mallard, snapping turtle, blue catfish (Ictalurus furcatus), channel catfish (I. punctatus), yellow bass (Morone mississippiensis), freshwater drum (Aplodinotus grunniens), blue crab, river crawfish (Procambarus blandingii), Rangia cuneata, oyster, southern flounder (Paralichthys lethostigma), sheepshead (Archosargus probatocephalus), and pecan trees.

Environmental Changes in the Project Area

In the years since the construction of the parish levee system in the 1960s, the environmental setting of the project area has been altered significantly. Prior to the 1960s, the project area west of the natural levee of Bayou Lafourche primarily consisted of fresh and brackish water marsh. Residents of the area formerly used this marshland for crawfishing, trapping, and waterfowl hunting. Since the construction of the parish levee system, settlements and pastures have encroached on this area.

CHAPTER III

THE PREHISTORIC SETTING

Aboriginal Culture History

Tchefuncte Period

The earliest documented prehistoric period in Lafourche Parish is the Tchefuncte period (Smith et al. 1983), which dates approximately from ca. 500 B.C. to A.D. 200 (Neuman 1984:113-136; cf., Shenkel 1984:44). During the Tchefuncte period, pottery became important in prehistoric Louisiana, and increasing amounts of pottery with rocker stamped decoration and with tetrapodal supports were made. The soft Tchefuncte pottery had poorly compacted paste, and common vessel forms included bowls and cylindrical and shouldered jars. Decoration included fingernail and tool punctation, incision, simple stamping, drag and jab, parallel and zoned banding, and stippled triangles.

The Tchefuncte artifact assemblage includes boatstones, grooved plummets, mortars, sandstone saws, barweights, scrapers, and chipped celts. Socketed antler points, bone awls and fish hooks, and bone ornaments also have been found. Projectile point types found in Tchefuncte contexts are Gary, Ellis, Delhi, Motley, Pontchartrain, Macon, and Epps.

The population of the Tchefuncte period appears to have been a melange of long-headed Archaic peoples with a new subpopulation of broad-headed people who practiced cranial deformation, and who are thought to have entered the Southeast from Mexico. The presence of rocker stamped pottery, zone and panel decorations, and of some other individual traits (*viz.* Shenkel 1984:64-65), also shows similarities to the Hopewellian development (500 B.C. to A.D. 300).

Tchefuncte subsistence strategies appear to have two orientations (Shenkel 1984:44-45). First, inland groups focused on the river terrace and floodplain habitats of the lower Mississippi alluvial valley. The second strategy involved the utilization of the Louisiana coastal plain and Mississippi River delta. Shenkel (1984:65) suggests that this shift to coastal resources represents a new adaptation by prehistoric peoples. The paucity of sites in these coastal zones may be a result of site loss (through coastal subsidence, reworking of coastal deposits, and/or fluctuating sea levels), rather than an orientation toward a previously unexploited resource. Despite the lack of earlier sites in similar settings, the following generalizations concerning utilization of the coastal environment during the

Tchefuncte period are possible.

Shenkel (1984:66-67) notes the association of all Tchefuncte sites in the coastal plain of Louisiana with shell middens, comprised primarily of Rangia cuneata. While adjacent habitats were exploited (viz. Byrd 1974, 1976), emphasis is placed on locations adjacent to habitats favorable to the growth of Rangia (i.e. brackish marsh with occasional fluctuations in salinity). The majority of the other exploited species recovered from Tchefuncte sites are accessible in these same habitats (e.g., fish, turtles, etc.). Byrd (1976:28-30) notes this emphasis may be a reflection of a selection of settlement locations near a constant predictable resource (Rangia), rather than a primary subsistence focus on molluscan fauna. Byrd (1976:30) suggests that other resources, e.g., fish, deer, and plants, formed the staples of Tchefuncte diet, with Rangia providing a stable, but minor, component.

More recent assessments of shellfish utilization by Goodwin (1986) and Claassen (1986) suggest that the exploitation of brackish water species on the Gulf coast is limited seasonally to Spring to Fall occupations. This seasonality is reflected in sites dating from the Middle Archaic through the Mississippian periods. Claassen's (1986) estimates of seasonality are based on estimated seasons of death among samples of shellfish from 94 sites throughout nine southeastern states; Rangia cuneata were used for the sites from Florida and Texas. Claassen (1986:33) concluded that shellfish represent a seasonal staple in the diet of most horticulturalists, as opposed to a supplement as suggested by earlier researchers or a year-round component as observed among many modern hunter-gatherers. This assessment is not contradictory to Byrd's (1976) assessment of Rangia utilization in coastal Louisiana.

Therefore, Tchefuncte period sites within the greater region could be expected to represent seasonal (Spring to Fall) occupations of the deltaic marshes. To date, no Tchefuncte sites have been discovered in this portion of Lafourche Parish. This is likely the effect of the fairly recent development of the Lafourche delta (Gagliano et al. 1975:42; Smith et al. 1985:37).

Marksville Period

The subsequent Marksville period (100 B.C. - 300 A.D.) to a large degree was a localized hybrid manifestation of the Hopewellian culture climax that preceded it in the Midwest. The type site is located at Marksville, in Avoyelles Parish, Louisiana. Elsewhere in the state, smaller sites occur which display both Marksville pottery types and a modified form of the Marksville mortuary complex. Marksville houses appear to have

been circular, fairly permanent, and possibly earth-covered. A fairly high level of social organization is indicated by the construction of geometric earthworks and of burial mounds for the elite, as well as by a unique mortuary ritual system. Although large quantities of burial furniture are not recovered from Marksville sites, some items, such as elaborately decorated ceramics, were manufactured especially for inclusion in burials.

Marksville ceramics were well-made, with decorations that included u-stamped incised lines, zoned dentate stamping, zoned rocker stamping (both plain and denate), the raptorial bird motif, and flower-like designs (Toth 1977; Phillips 1970; Ford and Willey 1940). The cross-hatched rim is particularly characteristic of Marksville pottery, and may relate this complex to other early cultural climaxes in the Circum-Caribbean area. Plain utilitarian wares also were produced. Perforated pearl beads, bracelets, and celts have been recovered from Marksville contexts.

While no Marksville period sites have been recorded in the Lafourche delta, sites with occupations from this period are present in other deltaic areas. In these areas, Marksville period sites are associated with the natural levees of active distributaries within the earlier Teche and St. Bernard deltas (Gagliano 1975:41-42). The absence of sites from this period is related to the stabilization of the Lafourche delta at a date later than that associated with Marksville occupations (i.e., post A.D. 300).

Troyville-Baytown Period

The next cultural period identified for South Louisiana is Troyville or Baytown (A.D. 300 - 700). This transitional period followed the decline of the Hopewellian Marksville culture, and it is poorly understood. In his recent book on Louisiana archeology, Neuman (1984) combines the Troyville period and culture with the better understood Coles Creek period; similarly, Davis (1984) contains chapters on early Woodland period prehistory and on late (Coles Creek period) prehistory, while failing to address substantively the transitional Troyville-Baytown period. Knowledge of the Troyville culture is based on the type site at Jonesville, Louisiana, and on the discovery of Troyville ceramics in other sites. Among the pottery types clustering in the Troyville period are: Mulberry Creek Cord Marked, Marksville Incised (Yokena), Churupa Punctated, Troyville Stamped, Larto Red Filmed, Landon Red-on-Buff, and Woodville Red Filmed. However, these pottery types and most other traits are not confined solely to this period. Troyville is thought to represent the period when maize agriculture and the bow and arrow were adopted. Evidence for agriculture includes shell hoes and grinding stones.

Given the reduced emphasis placed on the Troyville period, little can be said about site locations. Sites in southwestern Terrebonne Parish occupy old beach ridges. These sites may be associated with Lafourche delta distributaries which were spreading into the then deteriorating Teche delta (Gagliano et al. 1975:42). Therefore, sites associated with the Troyville period can be expected along distributaries within the project area. There is one known Troyville site within the lower Bayou Lafourche area, the Bayou L'Ours mound (16 LF 54). This site is associated with a major Lafourche distributary.

Coles Creek Period

The subsequent Coles Creek period (A.D. 700 - 1200) developed out of Troyville. Coles Creek was a dynamic and widespread manifestation throughout the Lower Mississippi Valley. Coles Creek may be viewed as the local early or pre-classic variant of the Mississippian tradition, and its emphasis on temple mound and plaza construction suggests Mesoamerican influences. Population growth and areal expansion were made possible by increasing reliance on productive maize agriculture. The seasonal exploitation of coastal areas supplemented the maize economy of large inland sites, and small non-mound farmsteads were present. A stratified social organization with a dominant priestly social class continued.

The construction of platform mounds became important during this period. These were intended primarily as bases for temples or other buildings, but they also contained burials. Smaller circular mounds were still present. A common motif of Coles Creek ceramics is a series of incised lines parallel to the rim. Pottery types include: Coles Creek Incised, Pontchartrain Check Stamped, and Mazique Incised.

Coles Creek settlement and subsistence patterns have received much attention in most portions of the Lower Mississippi Valley. However, little emphasis has been placed on this aspect of the Coles Creek cultural adaptation within the delta region of Louisiana. Brown (1984:100-101) suggests that the majority of Coles Creek period sites in the Petite Anse region (to the west of the project area) lie along small bayous and minor distributaries within the coastal marshes. Most are small middens containing shell from Rangia cuneata. As with earlier periods, the importance of molluscs within the diet may be exaggerated by their greater visibility in archeological deposits (Raymond 1981:807). Fish and mammals represent larger portions of the subsistence base from those sites where extensive faunal analyses have been conducted (Brown 1984:106-107). In addition, larger sites, some of which are associated with mounds (e.g., 16 LF 54), occur along

major distributaries within the Lafourche delta (Gagliano et al. 1975:43). These sites may represent more permanent settlements, possibly oriented towards agricultural production, than the smaller shell middens described above. The degree of dependence on domesticated food resources is unknown at present. Brown et al. (1979) have argued strongly against extensive utilization of cultivated resources in the coastal areas of Louisiana until the Plaquemine period. The association of a shell midden with the only Coles Creek mound site near project area (16 LF 54) may suggest a possibility that even these larger sites may have been seasonally occupied in this portion of the Lafourche delta. Further subsistence analyses are necessary to address this premise adequately.

Therefore, most of the Coles Creek period sites present in the project area are expected to represent seasonal occupations of areas along smaller active distributaries within the marsh. These sites probably represent base camps occupied during the exploitation of various resources within this area (e.g., shellfish, mammals, reptiles, fish, etc.). Sites associated with this period include the Larose site (16 LF 36) associated with an old levee of Bayou Lafourche, a shell midden (16 LF 41) located on Bayou Blue, and the Bayou L'Ours site (16 LF 54), a mound associated with a major Lafourche distributary.

Plaquemine Period

In the southern part of the Lower Mississippi Valley, the Plaquemine culture developed out of a Coles Creek background. Ceremonial sites of this period consisted of several mounds arranged about a plaza area. Associated small sites were dispersed about such centers. Social organization and maize agriculture were highly developed. The most widespread decorated ceramic type of the Plaquemine period was Plaquemine Brushed. Other types include Harrison Bayou Incised, Hardy Incised, L'Eau Noir Incised, Manchac Incised, Mazique Incised, Leland Incised, and Evansville Punctate. Both decorated types and plainwares, such as Anna Burnished Plain and Addis Plain, were well made. Diagnostic Plaquemine projectile points are small and stemmed with incurved sides.

The distribution of most Plaquemine period sites within the Lafourche delta is similar to that noted for Coles Creek period sites. Small sites, such as seasonally occupied shell middens, occur on the distal ends of distributary channels (Gagliano et al. 1975:43). Some larger sites have been located on the natural levees of the larger drainages such as Bayou Lafourche.

The best known Plaquemine-Mississippian site in the study area is 16 LF 1, the Toups Place shell midden recorded originally by

Fred B. Kniffen in 1941. Collected artifacts included pottery, oyster shells, polished stones, and animal effigies. Other Plaquemine sites include the Boudreaux site (16 LF 99), located between Bayou Lafourche and the study corridor at Belle Amite. This appears to have been a campsite; it contained pottery, bone, and several historic beads. The site 16 LF 97, located 1.5 miles northeast of Larose, is thought to be a Plaquemine period midden or living area.

Late in the prehistoric period, the indigenous Plaquemine culture came under the influence of Mississippian cultures from the Middle Mississippi River Valley. Mississippian culture was characterized by large mound groups, a widespread distribution of sites, and by shell tempered pottery. A distinctive mortuary cult or complex, referred to as the "Southern Cult," that made use of copper, stone, shell, and mica was introduced, and elaborate ceremonialism reflected in animal motifs and deities pervaded Mississippian culture. Trade networks were well established during this period, and raw materials and specialty objects were traded across large areas of the central and southern United States.

Settlement and subsistence patterns during this late period appear similar to those noted for the Coles Creek and Plaquemine periods. Small, seasonally occupied sites representing resource extraction within the marsh are found along and at the end of the distributaries which dissect the delta (Gagliano et al. 1975:43). Larger sites occur on the more extensive areas of natural levee deposits along Bayou Lafourche.

Mississippian Period

In the Lafourche Delta area, there seems to have been a stable continuation from Coles Creek-Plaquemine times to the Mississippian period. The two known Mississippian sites in the study area include Bayou L'Eau Bleu (16 LF 31), a shell midden, and the Clovelly (16 LF 64) shell midden. 16 LF 31 is thought to be a Bayou Petre Phase site. Both sites are associated with relict stream channels or old bayous.

After European contact, several historic tribes or enclaves were reported in the Lafourche Delta Area. The Chitimacha were recorded as living on Bayou Lafourche (Gibson 1982:84-88); the Lafourche Chitimacha vacated their villages after fighting the French in 1706 (Gibson 1982:86), and they migrated to the Charenton area on the lower Bayou Teche (Gibson 1982:249). The archeology of Chitimacha sites in the lower Teche recently has been discussed in detail by Goodwin et al. (1985).

In addition, the Washa and Chawasha are reported in the upper

reaches of Bayou Lafourche during the early eighteenth century. These groups participated in the French military activities against the Chitimacha in 1706 (Swanton 1911:30). After 1718, however, both groups had vacated the Bayou Lafourche region through intentional movements by the French colonial authorities (Swanton 1946:108-109).

No known sites associated with these particular groups have been identified within the project area. The presence of trade beads in sites such as the Boudreaux site (16 LF 99) suggests that occupations by historically known aboriginal groups may be present in the general area encompassed by the Larose to Golden Meadow Hurricane Protection Project.

Two other previously recorded sites are located in the general region of the survey corridor. However, no cultural affiliation has been assigned to them. They are the Delta Farms (16 LF 76) and Bayou Raphael (16 LF 88) sites. Table 1 provides a summary of the various prehistoric cultural periods and their associations with the identified deltas of the Mississippi River.

This review of aboriginal culture history in the Lafourche Delta Complex has been extrapolated in large part from the archeological literature on the Lower Mississippi Valley. In reality, the region remains little known archeologically, and any synthesis of its prehistory should be recognized as a tentative or largely hypothetical reconstruction.

A Review of Previous Research

The first archeological investigations in the immediate vicinity of the project area were carried out by Fred B. Kniffen in 1941. Kniffen recorded the Touns Place (16 LF 1), a Coles Creek-Plaquemine shell midden, situated approximately 11 kilometers southeast of the survey area and 1 kilometers south of Clovelly Farms.

During the 1950s, William G. McIntire conducted the first systematic archeological survey in coastal Louisiana. McIntire was primarily concerned with the reconstruction of the sequence of Holocene events using correlations between geomorphic features and initial occupation ages of Indian sites. These studies (McIntire 1954, 1958) located over 500 sites along the Louisiana coast.

In 1974, McIntire conducted a survey of the proposed oil pipeline route for the Louisiana Offshore Oil Port (LOOP). The Bayou L'Ours site (16 LF 54) and the Bayou Raphael site (16 LF 88)

**Table 1. The Association of Mississippi River
Delta Lobes with Prehistoric Periods
(after Beavers et al. 1984; Gagliano
et al. 1975).**

<u>Delta</u>	<u>Period</u>
Lafayette (12000 - 8400 BP)	Paleo-Indian, Early Archaic
Sale Cypremort (8500 - 5000 BP)	Middle to Late Archaic
Cocodrie (5000 - 3500 BP)	Poverty Point
Teche (2500 - 3500 BP)	Tchefuncte to Marksville
St. Bernard (2700 - 1700 BP)	Marksville
Lafourche (1700 - 100 BP)	Troyville, Coles Creek, Plaquemine, Mississippi
Plaquemine (1000 BP to present)	Plaquemine, Mississippi
Balize (550 BP to present)	Historic

were reported. Site 16 LF 54 is a Troyville-Coles Creek period earth mound; the cultural affiliation of 16 LF 88 is undetermined. The former site was revisited by members of the Division of Archaeology, State of Louisiana, to delimit and flag the site prior to pipeline construction.

In 1975, Gagliano et al. (1975) conducted a survey of the Gulf Intracoastal Waterway in Louisiana. This study reported one site near the project area. Gagliano et al. (1975) did develop an extensive geomorphological history of coastal Louisiana. They were able to identify expected cultural associations with the known delta lobes of the Mississippi River which comprise this region. These correlations between the various deltas permitted predictive statements concerning the age of possible sites which may exist along the Louisiana coast. The results of these comparisons were employed in this study to define expectations concerning the age of possible sites within the project area.

Most recently, investigations in the study area have included cultural resource surveys of various segments of the Larose to Golden Meadow Hurricane Protection Project. There have been six such investigations, including Gibson's (1978) study of the Clovelly Farms levee and the Louisiana Land and Exploration Company levee realignment, Rader's (1978) survey of the Golden Meadow Floodgate, McIntire et al.'s (1981) study of Sections "F" First Lift and "A" East First Lift, Stout and Muller's (1983) study of the Larose Floodgate, McCullough's (1984) study of Section B North and South Gap Closure, and the Ryan and Hicks (1984) study of Reach E South. These surveys located no prehistoric cultural resources in the project areas. Stout and Muller (1983) did record a cultural resource of historical significance, the passenger vessel "M/V Fox." The vessel subsequently was determined to be eligible for nomination to the National Register of Historic Places (Goodwin et al. 1984). HAERs documentation of the M/V Fox subsequently was undertaken by the New Orleans District, Corps of Engineers (Goodwin and Selby 1984).

Although each of the studies listed above attempted to identify and define cultural resources within the various project right-of-ways, there was no effort to formulate specific research designs, and the stated research objectives were extremely limited in scope, i.e., to locate and describe cultural resources or to locate and assess project impact of cultural resources (Gibson 1978; Stout and Muller 1983; McCullough 1984; Ryan and Hicks 1984). It is fair to state, however, that three of these studies (i.e., McCullough 1984, Rader 1978, Stout and Muller 1983) were limited to small areas of possible impacts related to the construction of particular facilities. Two of the six reports also stated as a second objective to provide further insight into and to provide explanations for cultural variability (Gibson 1978; Ryan and Hicks 1984); both failed to do so. All of these studies, with the

exception of the study by McIntire et al. (1981) have adopted a totally inductive perspective to archeological investigation. No attempt has been made to generate hypotheses or predictive statements that the recovered data might address. McIntire et al. (1981), though he failed to specifically state his study objectives and formulated no explicit research design, did attempt to relate geomorphology with prehistoric procurement strategies and settlement patterns by identifying high probability areas based on landforms. Such areas included modern and relict stream courses, buried levees, old levees, and beaches (McIntire et al. 1981).

A more recent study conducted near the project area is the Beavers et al. (1984) survey of the upper Lafourche delta in Lafourche and Terrebonne parishes, Louisiana. Using the geomorphic history of the region and certain expectations concerning human utilization of the delta environment, Beavers et al. (1984:61-66) developed predictive statements concerning locational and functional patterning for both prehistoric and historic sites. For prehistoric sites, these hypotheses were: site size is related directly to the amount of flow within associated distributary channels; smaller streams and lake margins would be occupied for the purpose of exploiting specific resources at the location of the site; and, sites no earlier than the Marksville period could be expected within their project area. Unfortunately, a paucity of discovered prehistoric sites prevented the assessment of these hypotheses.

The most recent archeological investigation near the project area was Goodwin and Selby's (1985) survey of the proposed Riverway Gas Pipeline Company's Larose to Paradis pipeline. This study located no new archeological sites along the project corridor in either Lafourche or St. Charles parishes. Three previously recorded sites were visited and reexamined to provide a more complete record of these sites for state site files. Two of these sites (16 LF 3 and 16 LF 94) are in Lafourche Parish; however, neither lies near the present project area.

Survey methods in all the studies concerned with the Larose to Golden Meadow Hurricane Protection Project consisted of a pedestrian examination of the right-of-way supplemented with subsurface testing, with the exception of Gibson's investigations of the LL & E realignment survey which was conducted "from a vehicle moving at relatively slow speeds" (Gibson 1978). Some areas inaccessible to a vehicle were walked. Although Gibson's report (1978) depicted seven sites, 16 LF 57 - 63, site forms for these sites have not been submitted to the Louisiana Division of Archaeology. Hence, the nature and cultural affiliations of these sites are unknown.

In summary, previous investigations were based on a minimal theoretical framework with very little emphasis on predictive hypothesis formulation and testing. Not enough emphasis was placed on the close relationship between prehistoric habitation and the changing morphology and environment of the study area.

General Expectations Concerning Prehistoric Sites

No previously recorded sites were reported within the surveyed areas encompassed by Sections A West, B North and South, or C North and South of the Larose to Golden Meadow Hurricane Protection Project. Seventeen sites were recorded within the greater project area. Most of these sites lie on the east side of Bayou Lafourche. Information concerning these sites was extracted from the existing state records in an effort to characterize the nature of the archeological resource base that was expected to exist within the current project area.

Information extracted from the state files included site size, temporal association, and site type. Site size was selected to permit discussions of previous and future impacts to the archeological resource base. Temporal association provided a basis for the diversity of information that was expected within the resource base. Site type provided an assessment of the potential kinds of information that may have been lost through previous or future disturbance. These data permit the development of generalizations concerning the nature of sites that may exist within the project corridor west of Bayou Lafourche. It should be noted that most of this information was inadequate due to the poor site information recorded on most of the site forms. This caveat notwithstanding, the following generalizations can be made.

Thirteen of the 17 sites provided information related to site size on their state site forms or on locational maps in Gibson (1978). Dimensional information existed on the state forms for four of the 13 sites. All other information concerning site size was extracted from maps which display the location of the sites from Gibson (1978). Area estimates by planimeter were calculated from these maps. These estimates were compared to the recorded area estimates to determine the relationship between the site size indicated on the maps and the actual recorded dimensions. All planimeter estimates were adjusted to reflect the error observed between the map dimensions and those recorded in the state records. These figures were felt to be more realistic due to possible drafting error represented by the plotting of the sites and the planimeter error when measuring small areas.

Maximum single dimensions for three of the recorded sites range from 23 to 136 meters. Minimum dimensions range from six to

15 meters. Site sizes range from 138 square meters to 2040 square meters with a mean of 524.3 square meters ($n=13$, $s=518.177\text{ m}^2$). Median area is 1089 square meters and the sample mode is 168 square meters. Twelve of the sites display areas less than the median value; nine display values less than the mean. These data are summarized in Table 2.

These data implied that site areas will be small. Site areas less than 1000 square meters were to be expected for most prehistoric sites (probability = 0.835 for area less than 1000 m^2). These expectations conform to the size of sites which could be expected through the utilization of the project area suggested for prehistoric peoples above.

Temporal associations were identified for eight of the 17 known sites. Three sites (16 LF 36, 16 LF 41, 16 LF 54) contained Troyville-Coles Creek or Coles Creek components. Three sites (16 LF 1, 16 LF 97, 16 LF 99) contained Plaquemine-Mississippian components. The other two sites (16 LF 31, 16 LF 64) contained Mississippian components. These occupations coincided with the development of the dominant surface patterns of distributaries noted for the Lafourche delta lobe by Gagliano et al. (1975). While earlier occupations are possible, all observed sites contained components related to the Coles Creek or Mississippi periods. Therefore, the majority of the possible sites which existed within the project area were expected to represent these later periods.

Site types for the region were identified by McIntire et al. (1981:52-54). These types were shell middens, earth middens, shell mounds, earth mounds, and beach deposits. Shell middens represented the accumulation of refuse related to food consumption during the occupation of a site area. Much of this detritus was composed of molluscan shell. In coastal Louisiana, the majority of these remains were Rangia cuneata. Following Goodwin (1986) and Claassen (1986), these sites represented seasonal occupations during the Spring to Fall months. Earth middens represented similar types of refuse (i.e., faunal remains, botanical remains, domestic refuse) in areas which lacked shellfish. These types of sites were more common away from the coastal areas. Earth and shell mounds are small hills intentionally constructed by the occupants for ceremonial purposes (e.g., burial of human remains, raised "temple" settings, etc.). Earth mounds are the more common of the two mound types. Beach deposits represent secondary deposits of materials from the other types of sites. These sites provide evidence of coastal erosion processes.

Three of these types were identified within the sample of sites discussed herein. Seven sites were identified as shell middens. Four of these sites (16 LF 1, 16 LF 31, 16 LF 97, 16 LF 99)

Table 2. Estimated Areas of Known Sites Near the Project Area.

<u>Site</u>	<u>Dimensions (m)</u>	<u>Area (m²)</u>
16LF1	?	224*
16LF31	?	?
16LF36	?	?
16LF41	6 X 23	138
16LF54	?	800
16LF57	?	672*
16LF58	?	420*
16LF59	?	168*
16LF60	?	504*
16LF61	?	168*
16LF62	?	168*
16LF63	?	224*
16LF64	15 X 30	450
16LF76	? X 15	?
16LF88	?	840*
16LF97	15 X 136	2040
16LF99	35 X 65+	<u>1413+</u>
Total		6896
Mean		524.31
St. Dev.		518.177
Median		1089
Mode		168

* Adjusted planimeter areas

+ Not employed (includes only portion of the site)

? Data not available

contained Mississippian components; two (16 LF 41, 16 LF 54) contained Coles Creek components; and, one shell midden was not associated with a known temporal phase or period. Two sites were identified as earth middens. One site (16 LF 36) contained a Coles Creek component; the other site (16 LF 64) was associated with the Mississippi period. Two of the middens (16 LF 54 and 16 LF 64) contained mound features as well. The former represented a Troyville-Coles Creek occupation and the latter represented a Mississippi one.

From these data, the majority of shell middens discovered within the project area contained Mississippi components. Earth middens and mounds of both the Coles Creek and Mississippian periods were discovered. While these data were suggestive, they probably represented biases in visibility more than differential exploitation by different prehistoric groups. That is, shell middens were likely to be more visible than middens which did not contain shell. Thus, the current site inventory for the project area was not representative of the archeological resource base of the region. These data must suffice in lieu of a more representative population of sites.

In summary, most of the sites expected to exist within the project area represented seasonally occupied loci related to the exploitation of specific resources at or near the site location. Many of these sites were associated with shell middens of Rangia cuneata. Occupations related to the Troyville, Coles Creek, Plaquemine, and Mississippian periods were expected within these sites. Later occupations (i.e., Plaquemine and Mississippian) were expected more frequently due to the recent development of the Lafourche delta and its distributary network. Some of these sites may have represented occupations by known historic indigenous groups such as the Chitimacha.

Project-Specific Expectations Concerning Prehistoric Sites

A substantial portion of the project area is marshland and backswamp. Many of the prehistoric adaptations to the area were based on a hunting, fishing, and gathering economy. Short-term hunting or fishing camps were believed to be present in the backswamp areas, but the probability of recovering such sites was considered low due to both the nature of typically transient, short-term occupation of such sites, and to continuing sedimentation. Therefore, most sections of the survey area located in these areas were considered to be low probability areas for the recovery of prehistoric archeological remains.

The exceptions to this are areas where former distributary and interdistributary channel ridges cross the project right-of-

way. These small relict ridge features, visible on 1978 color infrared air photo imagery of the project area provided by the New Orleans District, U.S. Army Corps of Engineers, were plotted on USGS 7.5 minute quadrangles of the project corridor (Figures 2-4). They were considered relatively high probability locales for the recovery of cultural resources. Pedestrian survey and subsurface shovel and auger test regimes were intensified in these areas in order to discern both the locations of the relict geomorphological features and the presence or absence of any associated cultural remains.

Site formation throughout all periods of prehistoric occupation frequently occurred on the highest ground in the swamps and marshes. These higher elevations consist of natural levees bounding the distributary bayous. Furthermore, agricultural adaptations were possible where the natural levees were substantial enough to support them. Natural levees exist along Bayou Lafourche where Section A West begins 200 meters west of the bayou, in the northern portion of Section C South, and in Section C North. These areas were considered to possess higher potential for containing prehistoric sites than the marsh areas described above.

Section C North possessed the greatest potential for the identification of prehistoric cultural resources. This stretch of the project corridor passes through woodland and open pastures, and directly over a natural levee on the southern side of Bayou Manuel. This natural levee was thought to be an area of high probability for containing prehistoric cultural resources.

CHAPTER IV

THE HISTORIC SETTING

Colonial Period

Earliest references to Bayou Lafourche date from the late seventeenth and early eighteenth century exploration of the Mississippi River by French explorers. Jean Baptiste le Moyne, Sieur de Bienville, and Pierre le Moyne, Sieur d'Iberville, made references to Bayou Lafourche as "le fourche des Chitimachas," the fork of the Chitimacha Indians, which was located near the present-day location of Donaldsonville.

The first historic settlement of Bayou Lafourche occurred on the upper stretch of the bayou near the Mississippi River. Broad natural levees, fertile ground, and access to the bayou and to the Mississippi River for transportation, established a settlement pattern that has persisted until today.

Due to the favorable policy of the French, encouraging colonists with substantial incentives of land, livestock, and material, numerous attempts at colonizing the Louisiana area were made by colonists of French and other nationalities. However, early attempts at colonization in Louisiana often resulted in failure. Colonists established themselves on small homesteads along the Mississippi near New Orleans, and later expanded upriver towards Baton Rouge. By 1731, Germans had begun to settle small farms on the upper portion of Bayou Lafourche (Knipmeyer 1956:24).

The population of French Colonial Louisiana increased only slightly during the first half of the 1700s. The colony still was not self sufficient in food production, although agricultural yields in cotton, tobacco, indigo, corn, rice, and vegetables increased. Industry and commerce were practically nonexistent. Military discipline was slack, settlements were subject to Indian raids, and France did little to promote development of the colony. In November, 1762, at the end of the French and Indian War, France ceded the depressed Louisiana colony to Spain. In February, 1763, Great Britain acquired East and West Florida from Spain, as well as lands north of New Orleans and east of the Mississippi River from France (Davis 1971: 70,97).

The arrival of the Spanish Governor, Don Alejandro O'Reilly, initiated a new period of development and settlement in the Louisiana territory. Agricultural production increased, and specialized products such as indigo and tobacco, flax, hemp, and later sugar cane, were grown on plantations. Small farmers, or petit habitants, produced corn, wheat, barley, rice, beans,

vegetables, and livestock.

By the 1790s, American flatboats from northern waterways began to arrive in Louisiana in increasing numbers. Foreign and domestic trade expanded rapidly. By 1802, imported goods included steel, fish, coffee, nails, clothes, hardware and tools, tile, corks, cordage, soap, shoes, clothing, empty bottles, and food stuffs. One-third of all imports consisted of alcoholic beverages (Taylor 1976:30; Davis 1971:137).

Between 1763 and 1802, the population of Louisiana significantly increased due to immigration. The most numerous group of immigrants was the Acadians, descendents of French immigrants to Nova Scotia who fled their homes or were deported by the British when France ceded Nova Scotia to Great Britain. Their arrival in Louisiana in large numbers began during the mid 1760s. Initial settlement was in the Attakapas country, along Bayou Teche. By 1790, Acadians were located along the Mississippi River in Ascension and St. James parishes, and along the upper half of Bayou Lafourche. Canary Islanders settled at Valenzuela; French West Indian refugees settled throughout southeastern Louisiana; and, Americans also were attracted to Louisiana by the promise of arable land.

The Acadians along Bayou Lafourche were small farmers who settled in dispersed settlements comprising small clusters of houses along the bayous. These settlements were common in the basin between Bayou Lafourche and the Mississippi (Knipmeyer 1956:48; LATELCO 1980:15). Hunting, trapping, and fishing provided goods for trade, and supplemented the agricultural food supply.

Of the various nationalities that settled along Bayou Lafourche in the eighteenth and nineteenth centuries, the Acadians clearly were the most influential in this area of geographic isolation. By the 1850s, Spanish, Germans, and Italians all had been assimilated or acculturated. French was the lingua franca on the Bayou, and Acadian customs predominated.

The last years of the Colonial Period saw continued development and settlement along Bayou Lafourche. Grants were made in the vicinity of Lockport, and settlers on lower Bayou Lafourche turned to exploiting swamp and marsh resources. Grand Isle residents established plantations; Barataria settlements remained small and isolated, providing a perfect haven for smugglers. The swamplands were exploited for timber, especially the cypress and oak used in shipbuilding and in building construction. Timber was one of the most valuable trade commodities exploited from the Louisiana colony, and continued to be important for the next hundred and fifty years. Also during

this period, the first canals were dug, widening and connecting existing waterways and improving access to New Orleans (Swanson 1975:136). Canals aided in drainage of swamplands and in the creation of more arable land for pasturage and for cultivation. By 1803, the area along Bayou Lafourche had a population of 2,800 (Bowie 1935:20).

Transition Between Colonial and American Period

After the American Revolution, and the opening of the western frontier, western settlers sought to sell their surplus goods on the world market. The Mississippi River was the primary, if not sole route to these markets, and New Orleans was the chief port for the transshipment of goods. The right to use the Mississippi and to deposit in New Orleans was granted to Americans by Spain in the Treaty of 1795; thereafter, river traffic increased. Spain had returned Louisiana to France in 1800 by the Treaty of San Ildefonso, but that transfer was not completed until 1803. In 1802, the port and lower river traffic were closed to Americans while France waited to negotiate a peace settlement with Great Britain. This action angered the western Americans, and stimulated American appreciation of the importance of the Mississippi River and of the port of New Orleans.

American Period

In 1803, with the sale by France of the Louisiana Territory to the United States, the land area of the United States almost doubled in size (Davis 1971:157-165). In 1804, William C. Claiborne was inaugurated Louisiana's first governor. A legislative council subsequently was appointed, and in its first meeting Louisiana was divided into twelve counties, each with a county judge, sheriff, coroner, clerk, and treasurer appointed by the governor. Lafourche was one of the original counties. In 1807, the territory was redivided into nineteen parishes. Thibodaux, thirty-four miles north of Larose, which had served as a trading post between New Orleans and Bayou Teche, became the parish seat of Lafourche in 1808. Thibodaux was incorporated in 1830 as Thibodeauxville; the name was shortened to Thibodeaux in 1838, and the spelling changed to Thibodaux in the 1900s (LATELCO 1980:42). The term "parish" derived from the French and Spanish terms for ecclesiastical divisions under the charge of a curate (Davis 1971:169). Louisiana was admitted to the Union as a state in 1812.

With the advent of statehood for Louisiana, settlement by Americans from all sections of the United States and particularly from the south and west, accelerated. Some of these American immigrants to Louisiana established themselves as landowners on

Bayou Lafourche, and planted cotton and sugar. Unlike the French planters who had established themselves on the river, the Americans on Bayou Lafourche established their plantations beyond the levee crests which were occupied by small French Acadian farms. On the upper half of Bayou Lafourche, a linear area of thirty-four miles, the natural levees were comparable in size to those of the Mississippi River; that is, they were about three miles wide. Between Thibodaux and Valentine, a twenty-eight mile section, the levees narrow considerably, reducing arable land. Three of the eight plantations in this latter area were established on the sites of former crevasses, which provided more fertile land. Below Valentine, plantations occurred on the banks of the bayou or on the levees of smaller bayous. Rehder (1971) has described the configuration of plantations along Bayou Lafourche, which reflect the nature of the earlier settlements of the petit habitants, as following the block and grid patterns characteristic of the Anglo-American Upland South and of the Tidewater South plantations (Rehder 1971:97-98).

Throughout the first half of the 1800s, sugar planting and production increased in southern Louisiana. However, the earlier introduced varieties of Creole and Otaheite cane were replaced by the Purple and Striped varieties, which, although more resistant to cold weather and insects, were not easily milled by animal-powered equipment. The introduction of steam-powered mills in 1825 overcame this problem (Rehder 1971:76). By the 1850s, cane juices began to be boiled in sealed vacuum-pans which allowed for better quality control and faster processing.

Although settlement in Lafourche Parish began during the mid eighteenth century, no large towns developed until 1830, the date of incorporation of Thibodaux. Thibodaux had been laid out in 1820, and by 1817 Bayou Lafourche had been settled for 90 miles along its banks (Bowie 1935:21). Settlements outside of Thibodaux remained widely scattered and consisted primarily of small farmsteads which produced corn, Irish potatoes, onions, peas, beans, and hay. Until the development of the cypress lumber industry during the 1890s, Lafourche remained predominantly agricultural between Donaldsonville and the present town of Larose. Industrial development was restricted to small sawmills, moss gins, a cotton gin, and a cigar factory (Bowie 1935:33).

While Thibodaux had a population of over 500 by 1840, population in lower Bayou Lafourche was small due to the lack of arable land. Agriculture along lower Lafourche has remained primarily small scale, and the inhabitants turned to fishing and the swamps for their livelihood (Bowie 1935:38-39).

Settlement along lower Bayou Lafourche slowly expanded southward. Because of the marginal suitability of the land for

agriculture due to the very small natural levees, settlement of the lower bayou lagged 100 years behind the upper portion of the bayou. The first small settlements in the lower reaches were in the Lockport area in the 1830s (Uzee 1968:122). Historic settlement continued to creep southwards at a rate of approximately 15 kilometers every 20 years. According to Uzee (1968:122-123), the Larose-Cut Off area was not settled before the 1850s, and the Golden Meadow area was not settled until the Cheramies moved in during the 1870s. Following this pattern, Leeville, south of the project area, was only settled in the 1890s by the survivors of a hurricane in 1893 that destroyed a settlement on Cheniere Caminada. Leeville, however, proved to be an unfortunate choice. It was destroyed in a hurricane in 1915, and the survivors moved north to settle in Golden Meadow.

The Serigny family established the first settlement between Lockport and Grand Isle (Raymond Serigny, personal communication 1986). The Serigny holdings consisted of an old crevasse or distributary ridge south of modern Golden Meadow. The land first was claimed in 1856 or 1857 by the great grandfather of Raymond Serigny. Utilization of the land was varied. Cypress trees were logged off, clearing the land, and the higher portions closer to the bayou were planted in sugar cane. The cane operation included a sugar processing plant, relic boiling pots which are said to remain on a ridge in the marsh, where they are used to water cattle. Additionally, the Serigny operation also cultivated rice on the sides of the ridge, where the crop was subject to seasonal flooding. During the late nineteenth century, the Serigny property was subdivided.

Most early inhabitants of the project area, however, maintained small subsistence scale farmsteads. They reaped the bounty of the bayous, swamps, and marshes for additional subsistence items, and they exploited such resources as skins, furs, and seafood.

The history of fur exploitation in the Mississippi Delta dates to the 1800s when alligator, mink, otter, and raccoon were trapped. Alligator were heavily exploited during the Civil War, when they were used for shoe leather. Raccoon pelts were a popular item from about 1830 until 1930. Muskrat, however, was not in demand until the early part of this century. Trapping in the marsh is typically a winter activity, conducted out of trapping camps scattered throughout the marsh. Before the advent of rapid boat transportation, these camps had to be located proximally to the trap lines. This resulted in trappers often taking their family on a "round" during the trapping season. Then as Spring approached, the trapper would settle his family in one place and prepare to exploit the aquatic resources such as fish and shrimp.

Between the 1850s and the 1880s, several railroads crossed Bayou Lafourche, one three miles below Thibodaux and another at Raceland. However, these provided access to the upper part of the bayou only, and lower Bayou Lafourche continued to rely on water transport.

Lockport, eleven miles north of Larose, developed after 1823 when William Fields, a native of Rhode Island, purchased substantial property in the area. Fields planted his lands on both sides of the bayou, and owned and managed a commercial barge line that transported sugar and molasses to the New Orleans market via Bayou Lafourche and the Mississippi River. Fields donated lands on both sides of Bayou Lafourche in the 1830s to the Barataria and Lafourche Land Company, for the development of a canal connecting the bayou to Lake Salvador. Construction of this Longueville Canal was completed in 1850.

During the War Between the States, the railroads at Raceland and Thibodaux were important to the defense of New Orleans. In 1863, Lafourche Crossing below Thibodaux became the site of a two-day battle between Union and Confederate troops. New Orleans had been captured in 1862, and Union forces were sent from Algiers to Donaldsonville in October, 1862. Union forces retained control of the Lafourche bayou country, and in the spring of 1863, the Confederates failed again in an attempt to retake Lafourche Crossing, only to retreat to Boutte, below New Orleans (LATELCO 1980:48).

Bayou Lafourche was predominantly agricultural at this time, and agricultural production suffered as a result of the conflict. As in other areas of the South, the Federal occupation of the state between 1863 and 1877 was a period of disorder. Racial troubles were one aspect of this disorder, as reflected in demographic data from this period. An 1850 census of Lafourche indicated a total population of 9,532, with Negroes outnumbering whites by 4,412. At the time of this census, only some 200 were free men of color. These figures change by 1880, when whites numbered 8,060 and Negroes 7,806. The decrease in black population appears to reflect the disintegration of organized plantation labor and the emigration of blacks to urban areas and to rural areas outside the parish. Conversely, the neighboring parishes of Assumption and Ascension both experienced significant increases in the Negro population.

Late Nineteenth and Early Twentieth Century Bayou Lafourche

Larose, approximately seventy miles south of Donaldsonville, has been considered a dividing point between upper and lower Lafourche. The natural levees decrease significantly in size at

this point, and below Larose backswamps generally occur only one half mile behind the levee. Agriculture along lower Lafourche has remained primarily small scale, and the inhabitants have turned to fishing and to the swamps for their livelihood. Much of the arable land there is used for pasture (Bowie 1935:38-39).

The development of the Larose area began in 1846, when Octave Harang purchased land which he developed into a sugar plantation. To facilitate transport of sugar and molasses to New Orleans, shortly after this land purchase, Harang constructed a small canal, little more than a ditch, that connected Bayou Lafourche and Lake Salvador. This canal entered Bayou Lafourche 67.75 miles (108.4 kilometers) below its head at Donaldsonville (Letter from the Secretary of War 1932:10). The canal had an active length of seven miles (11.2 kilometers) (Bank of Houma, 1910:65). The canal also was used by settlers on lower Bayou Lafourche to transport oranges, rice, and potatoes to New Orleans. In 1875, the Harang Canal was sold to Jules Leblanc.

During the nineteenth century, navigation on Bayou Lafourche was difficult at best. Historic records describe the Bayou as shallow at its head and occasionally dry during the summer and fall (Bowie 1935:25). Reports to the Chief of Engineers dealing with Bayou Lafourche between 1874 and 1932 noted the presence of snags and bars along the upper bayou which necessitated clearing by private individuals and by the Corps of Engineers to permit navigation. For eight months out of the year, the bayou was navigable from Donaldsonville to Thibodaux. The large river steamboats which regularly traveled the bayou, the "Henry Tete" and the "Lizzie Hopkins," which had carrying capacities of 700 hogsheads of sugar or more, only could travel during high water. Flatboats and luggers could go the entire length of the bayou during high water, and made daily trips between Lockport and Raceland. Semi-weekly trips were made between Raceland and Cut Off (Report to the Chief of Engineers 1874:766).

By 1886, the bayou had been improved somewhat and the number of trading vessels on the bayou increased. Commerce on the bayou, consisting mostly of sugar and molasses, was valued at three million dollars annually. The larger steamboats, such as the "Assumption," "Isabel," "E.W. Fuller," and "Alice LeBlanc," could navigate the bayou from December to August, making two trips per week to Thibodaux and sometimes as far south as Lockport. At no time could steamers pass through the Harang Canal or through the canal at Lockport. However, luggers often made trips to New Orleans carrying goods via these routes (Report to the Chief of Engineers 1886:1275). Increased volume of trade and clearance for navigation by the Corps of Engineers reflects denser settlement along the bayou during the late nineteenth century.

In 1908, the bayou was navigable its entire length by flatboats and log rafts. However, the damming of the bayou at its head increased siltation on the upper reaches of the bayou. Two small gasoline powered boats that travelled between New Orleans and Bayou Lafourche by way of Bayou Barataria and of the canals at Lockport and Larose replaced the steamer packets and passenger boats (Report to the Chief of Engineers 1908:428). The presence of log rafts on the bayou reflects the development of the cypress industry and the growth of the sawmill town of Bowie across from Raceland. By 1914, fourteen registered gasboats and seventeen unregistered gasboats plied the Bayou Lafourche to New Orleans trade route (Report to the Chief of Engineers 1914:2268).

The community which became Larose developed around the intersection of the Harang Canal and Bayou Lafourche. By 1890, over fifty families had settled in the area around Holy Rosary Catholic Church, which was established in 1873. A small school was attended by the local children. In 1890, Dr. Willie Harang induced a pharmacist friend from New Orleans to move to the settlement. Joseph Felicien Larose established a small pharmacy there and obtained permission to open an official postal service shortly thereafter. Until 1896, when the Rural Free Delivery system began operation in the parish, mail was addressed to "Larose."

The Harang Canal was sold in 1897 to Ormand Aymar, who, along with his brother Wilton, operated the waterway at least until its purchase in 1909 by Joseph Harvey of the Harvey Canal, Land and Improvement Company (LATELCO 1980:58). Aymar was responsible for improvement and dredging of the Harang Canal. He apparently retained some further interest in the canal, and maintained it with his dredge until sale of his remaining interest in 1913. The canal was subsequently renamed "Harvey Canal No. 2," using the name of the same family-owned land company which owned and operated the Harvey Canal that connects the Mississippi River at Harvey opposite of New Orleans to Bayou Barataria, a length of five and one-third miles (8.5 kilometers) (Bank of Houma 1910:65). In April, 1924, the United States Government purchased the Harvey Canal No. 2, which later was improved to nine feet (2.75 meters) deep by one-hundred feet (30.5 meters) wide, and which formed part of the Intracoastal Waterway (Letter from the Secretary of War 1932:10). Until 1925, the Intracoastal Waterway was referred to as the "Inter-coastal Waterway" by various proponents of the inland waterway system (Bank of Houma 1910).

Since the acquisition and development of the Harvey Canal No. 2 as part of the Intracoastal Waterway system in 1924, Larose has prospered. Shipyards and related industries, such as the construction of shrimp boats, have developed in the Larose area. Louisiana Highways 1 and 308 were improved by 1930, providing

passage for the trucks which replaced boats in transporting truck produce to market. Although as yet unincorporated, Larose today has a civic center, and it annually hosts a French Food Festival in October (LATELCO 1980:58, 59).

Ormand and Wilton Aymar ran a dredging operation on Harang Canal and also on an unidentified point on the south end of Lake Salvador. Live oaks on the point were cut, and shells were dredged there. Such activities were common during the 1920s and 1930s, when prehistoric shell middens were dredged for road material. Many of these prehistoric sites supported live oaks, since they constituted the highest elevations in the swamps and marshes along the coast. In 1909, a hurricane greatly damaged properties along lower Bayou Lafourche. High water in 1912 also caused flood damage to structures along the bayou.

Historic Site Expectations

Historic activity in the area is characterized by small scale agricultural development and by exploitation of swamp, forest, and aquatic resources. Of the many groups which settled within the Bayou Lafourche area, the Acadians, arriving in the late 18th century, have had the greatest impact. However, despite the significant Acadian influence continuing even to this day, the bulk of this historic activity and settlement should lie outside the survey area. Historic settlement patterns have continued along the lines of the prehistoric pattern insofar as exhibiting a preference for settling on high ground. Furthermore, as water remained the principle means of transport even after the penetration into the area by railroads in the late 19th century, the historic settlement generally faced the bayou to facilitate access to waterborne craft.

Historic sites were thought to be few, if represented at all, throughout most of Sections A West, B South and North, and C South. The type of site with the greatest probability of representation in this region was thought to be camps associated with hunting, fishing, trapping, or other extractive activities. These sites, dating from no earlier than the 1840s to 1850s would be transitory by nature. Such sites would be on the edges of water access routes. The only possible exceptions to this were thought to be at the eastern end of Section A West, where it is closest to the bayou, and in the northern portion of Section C South. The eastern portion of Section A West was thought to contain outbuildings from small farmsteads along the bayou, or refuse from aquatic resource processing. Again, however, these were not expected to date before 1850, and would be more likely to date well after that period. The probability of identifying such resources was low, due to the small area of the corridor, and especially in light of

the potential for significant disturbance and destruction of any possible resources as a result of first lift levee construction.

Historic occupation of Section C North was not significantly different from the other four sections. However, Section C North had the greatest potential for historic resources, since a significant portion of the right-of-way is on relatively dry land. This section approaches and runs parallel to the Intracoastal Waterway up to the town of Larose. Here, the potential existed for agricultural outbuildings, lumbering operations, trade-related activities along the Intracoastal Waterway, and industrial operations connected with shipbuilding in Larose. Historic sites in this area were not expected to predate the 1840s or 1850s, due to transitory use of the area prior to these dates. Later industrial development largely dated after 1900.

CHAPTER V

SURVEY METHODOLOGY

The project right-of-way, especially within Sections A West, B South, B North, and C South, has been considered to comprise regions with low probabilities for revealing evidence of prehistoric and historic occupation. Most of the area has been, until the construction of the parish levee system in the 1960s, swamp and marshland not typically considered to be areas of dense settlement. Generally, the marsh and swamp areas were utilized for resource procurement. Consequently, short-term occupation procurement sites were expected in the area. However, the probability to identify any such sites was reduced due to their transient nature and to continuing sedimentation.

The exceptions to this are the areas where former distributary and interdistributary channel ridges crossed the project right-of-way; these small relict ridge features, visible on 1978 color infrared air photo imagery of the project area provided by the New Orleans District, Corps of Engineers, were plotted on USGS 7.5' quadrangles of the project corridor (Figures 2-4). These areas were considered relatively high probability locales for the recovery of cultural resources. In these areas, pedestrian survey and subsurface shovel and auger test regimes were intensified in attempts to discern both the locations of the relict geomorphological features and the presence or absence of any associated cultural remains.

For Section C North, the same criteria were used to define high and low probability areas. Section C North had a greater amount of woodland cover, as well as pasture. Much of this section, while not marsh, is or was swampland subject to seasonal flooding. The areas in this section considered to exhibit high probability of revealing cultural resources were those where the relict distributaries and bayous cross the corridor. These ridges were also subjected to intensified survey and subsurface testing.

In areas deemed of low probability for cultural resources, the survey methods consisted of pedestrian survey. The pedestrian survey was coupled with a systematic subsurface testing regime spaced at 50-meter intervals. These subsurface tests consisted of shovel tests, and selective auger tests as deep as 140 centimeters. Additionally, efforts were made to inspect visually the cut-banks and spoil deposits associated with the numerous drainage ditches which cross the project corridor.

In the locations predicted to display a high probability for

containing archeological remains, the test regime was expanded and intensified using both additional pedestrian survey where vegetation permitted, and increased subsurface testing with shovel and auger.

Physical inspection of the project area was performed by the pedestrian survey of 1000-meter transects along the project corridor. These transects were oriented to parallel the borrow ponds in Sections A West, B South, B North, and C South. The alignments of the transects were altered to remain within the project corridor adjacent to these ponds (i.e., within 50 feet or 15.24 meters). Two parallel transects, or survey loci, were examined in Sections A West, B South, B North, and C South. In Section C North, four parallel loci were traversed to provide coverage of the wider corridor (300 to 350 feet, or 91.44 to 106.68 meters). The lengths of three of the thirty transects required to traverse the length of the project corridor were altered to provide a more efficient coverage of particular areas. Two transects in Section B South were lengthened to 1150 meters. One transect in Section B North was shortened to 150 meters.

Subsurface examinations along these transects were spaced at 50-meter intervals. Shovel or auger tests were excavated at these points in an effort to locate buried archeological materials and/or to identify variations in soils and subsurface deposits.

In the areas defined as possessing high probabilities for potential archeological remains, additional auger tests were excavated to permit more intensive coverage. These tests also helped to delimit the distributary features identified from aerial photographs which provide the basis for the hypothesized higher potential of site occurrence. Additionally, the banks of the borrow ponds, the banks of ditches or canals which crossed the project corridor, and associated spoil deposits were examined visually to determine whether extant or previously buried archeological remains were present. These examinations provided assessments of the nature of the impacts related to the activities responsible for the formation of the ponds, canals, and spoil banks. These assessments represented the basis for the discussions of previous and potential impacts presented in Chapter VII.

CHAPTER VI

RESULTS OF THE SURVEY

Field survey of the Larose to Golden Meadow Hurricane Protection Project area was conducted during late June and early July, 1986. Survey followed discrete engineering sections identified in the Scope of Work (Appendix 1). Survey sequence was: Section A West; Section B South; Section C North; Section C South; and, Section B North; the subsequent review of the results of field survey also follows that order.

Section A West

Sections A West and B South were the first surveyed (Table 3). Fieldwork began at the southernmost portion of the levee system. Auger tests were conducted in the first 1000-meter transect to determine the nature of the soils. The top 50 centimeters were consistently composed of spoil, probably resulting from the first lift operations. Below the spoil, tests revealed more homogeneous natural clays (Figure 7). No cultural remains were revealed by the subsurface testing. Additionally, vegetation along this section, primarily bloodweed and elderberry with very few trees, is indicative of the area having been cleared recently.

The second 1000-meter transect revealed fewer indications of disturbed spoil accumulations. However, there were frequent indications of disturbances on the surface. Previous impacts include excavations of drainage ditches, clearing for fields and pastures, and occasional shell fill in fields. Vegetation, as well as fences, indicated that areas now overgrown had been cleared in the past for field and pasture use. Occasionally, shells were found, but inspection showed these to be non-cultural, perhaps from food gathering by small animals, such as raccoons.

The third 1000-meter transect began similarly, passing through occasional cleared areas, but with most of the area being recently overgrown with bloodweed and elderberry. Impacts include drainage ditches, clearing efforts, and trash dumps. The northern end of this transect crossed over and occupied remnants of the old parish levee system. Clearly, the area has been subjected to impacts in the past. No cultural materials were identified in any of these tests or along the surface.

The fourth 1000-meter transect also ran through previously impacted areas. The area contained the remnants of several of the parish levees. Drainage ditches and cleared fields also dot the transect. A local informant said that the southern quarter of the

Table 3. Synopses of Transect Data, Sections A West and B South.

<u>Transect No./ Locus Designation</u>	<u>Length (m)</u>	<u>Direction</u>	<u>Vegetation</u>	<u>Survey Methods</u>	<u>Recent Use</u>	<u>Previous Impacts</u>
1A 1B	1000	S-N	thick bloodweed marsh elder, bramble	pedestrian	none	levee building, spoil deposits, drainage ditch
2A 2B	1000	S-N	bloodweed, marsh elder, hackberry, tallowberry, willow	pedestrian	cleared for field/ pasture	plowing, clearing, levee building, spoil deposits, drainage ditches
3A 3B	1000	S-N	marsh elder, blood- weed, hackberry, willow, pokeberry, bramble	pedestrian	cleared for field/ pasture	pasture/field clearing, levee construction, drainage ditches
4A 4B 4C	1000	S-N	oak, willow, pecan, hackberry, marsh, elder, pokeberry, bloodweed, bramble	pedestrian	cleared for field/ pasture	clearing for fields, parish levee construction, road building, levee construction
5A 5B	1000	S-N	tallowberry, marsh elderberry, oak, hackberry, willow, bloodweed	pedestrian	trash dump	heavy impact by highway and levee construction, drainage ditches, parish levee
6A 6B	1000	S-N	bloodweed, tallow- berry, hackberry, marsh elder, willow	pedestrian	oil pumping	oil extraction, levee building, drainage, ditch construction
7	1150	S-N	willow, hackberry, pokeberry, golden- rod, bloodweed, marsh elder	pedestrian	oil pumping, oil storage, shell roads	oil extraction, road building, levee construction, borrow pits, drainage ditches
8	1150	S-N	oak, pecan, marsh elder, balloon vine	pedestrian	cleared	park, levee construction
9	1000	S-N	balloon vines, marsh elder, grass	pedestrian	oil pumping	oil extraction, levee construction, road building, drainage, small containment levees

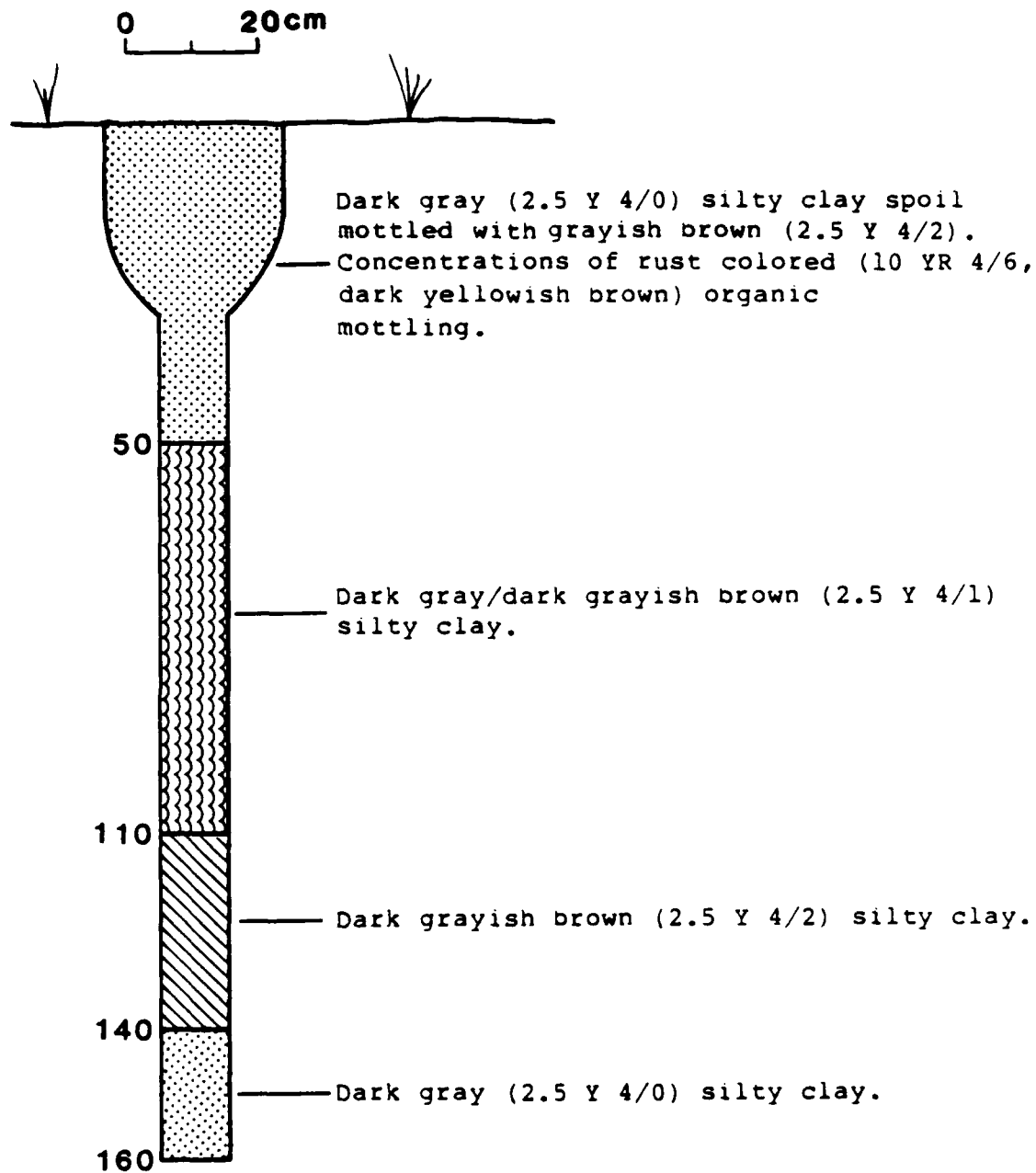


Figure 7. Profile of Auger Test 9, Section A West, Transect 1.

transect, which used to be marsh utilized for duck hunting, was now fill. An additional transect was run on two peninsula remnants, both of which were cleared for agriculture. All the tests and surface observation for cultural material provided negative results.

The fifth transect was heavily disturbed. It was very close to the new four-lane highway, and over a large area of fill at the Texaco Dock for more than half of its length. The remaining portion of the transect is in an area of spoil deposits. Also, drainage ditches have been cut through portions of the transects. The testing here revealed no cultural resources.

The sixth 1000-meter transect led almost exclusively through low marsh elder growth. This is an indication that it has been cleared in the recent past. The northern half of the transect passes by or crosses several roads accessing oil pumps and drill sites. The soil tests here indicated spoil and a great deal of disturbance throughout, probably as a result of oil extraction efforts. Additionally, drainage ditches and trash dumps dotted the area. No cultural resources were identified.

Section B South

The seventh transect, 1150 meters long, completed Section A West and started Section B South. A substantial portion of this area suffered impacts as a result of land filling, road cutting, levee building, and oil exploration and recovery. Drainage ditches were cut through this area with the resulting dredge spoil and construction refuse being deposited. None of these tests revealed any cultural remains, even though some drainages were identified provisionally in the field. Where located, these areas were tested with augers.

Section B South was the next section investigated. The transects here continued northward, paralleling the first lift borrow ponds. Transect 7, discussed above, began Section B South. Tests in Transect 8, 1150 meters long, consisted primarily of spoil. This transect ran through Golden Meadow Park, an area of heavy impact, and onto a tract of land recently cleared of brush with heavy equipment. The area also had been driven on extensively as indicated by dirt tracks left by wheels. A chenier was identified in Golden Meadow Park, lying outside of the study corridor. A series of auger tests was conducted along its length, but failed to reveal cultural materials. Figure 8 shows a typical profile from this series.

The next transect, Transect 9, concluded Section B South. It passed through an area of considerable disturbance. Virtually

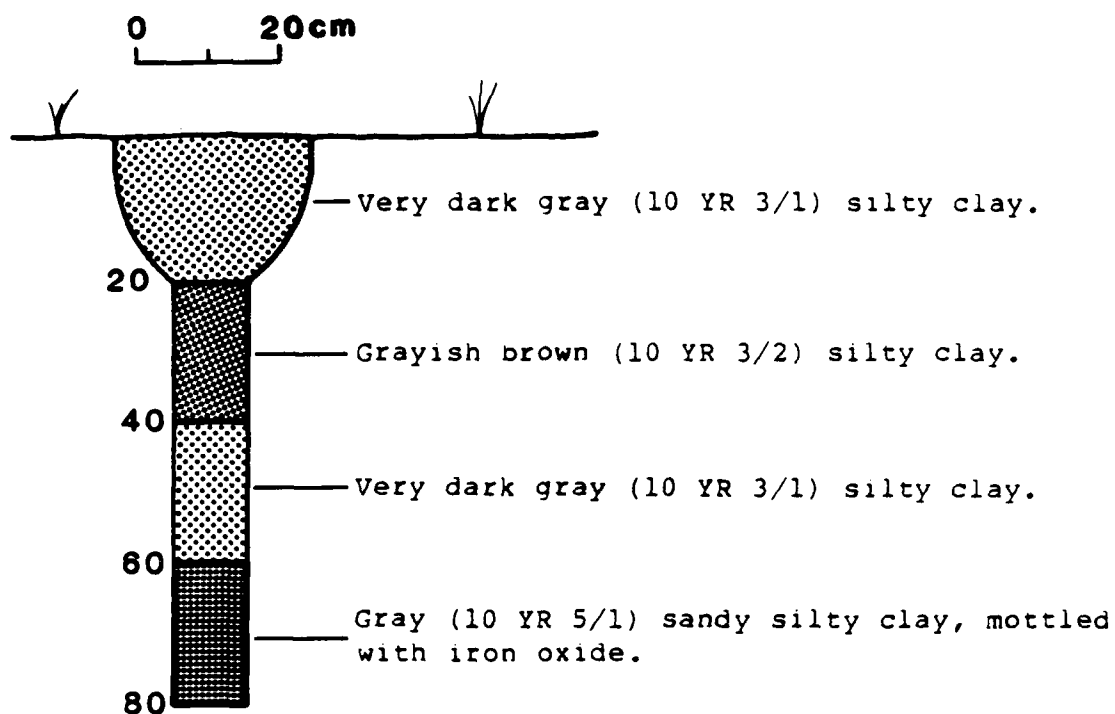


Figure 8. Profile of auger test conducted in wooded chenier in Golden Meadow Park, showing chenier stratigraphy.

all tests revealed spoil at the ground surface, probably resulting from first lift levee construction. Additional disturbance resulting from oil extraction and support facilities was evident. O'Neil Oil Company maintains several wells and pumps along the transect, as well as various storage facilities. An auger profile from Transect 9 (Figure 9) demonstrates the stratigraphy for this section.

Section C North

The next section surveyed, Section C North, was surveyed from south to north (Table 4). Section C North, which makes up the area previously undisturbed by first lift levee construction by the U.S. Army Corps of Engineers, consisted of a wider (300 - 350 feet; 91.44 - 106.68 meters) corridor. The field crew in this section consisted of four people walking 20 meters apart to cover the corridors. Each individual path within a specific transect was considered a locus. These loci were assigned a letter: A, B, C, and D. Locus A was the path closest to the existing levee, and Locus D was the path farthest away.

The first transect walked, Section C North Transect 1 (1000 meters), began on the flood side of the parish levee. An auger test was conducted at the first test increment (Figure 10). Following tests, both in woods and in pastures, continued to yield similar results. This transect has been exposed to activities that could have impacted any cultural resources present in this area. These include spoil deposition, wood cutting, and construction of the parish levee system in the 1960s. In addition, subsurface pipelines occasionally cross this and other transects, potentially disturbing subsurface deposits.

Section C North Transect 2, also 1000 meters long, crosses over pasture and through forest entering into swamp. Tests conducted by the field crew revealed soils as displayed in Figure 10. When the transect reached the edge of the swamps, testing was suspended because of inability to walk the transect or to conduct subsurface tests in 10 - 50 centimeters of standing water. At the point where the transect became submerged, the crew mounted the existing parish levee and continued on foot on top of the levee. The project corridor was inspected visually for accessible areas of dry land. None were found.

The third transect in Section C North was entirely inundated swamp with 10 - 50 centimeters of standing water. Therefore, no tests were undertaken along this transect. High water marks on trees within the swamp indicated water has flooded up to 1 meter above the present water level. Such flooding would inhibit year-round settlement in the area.

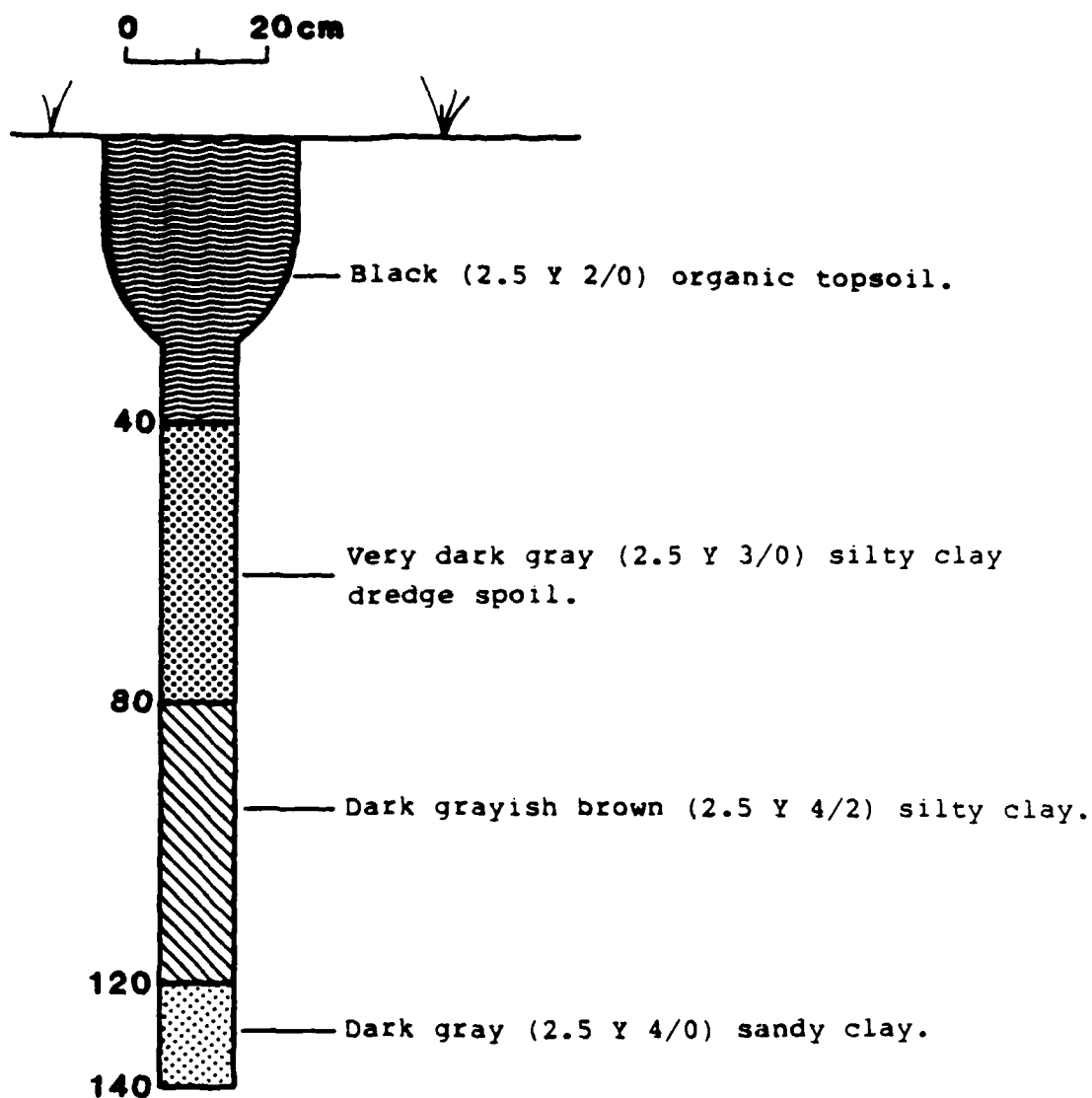


Figure 9. Profile of Auger Test 14, Section B South, Transect 9.

Table 4. Synopsis of Transect Data, Section C North.

<u>Transect No./</u> <u>Locus</u> <u>Designation</u>	<u>Length</u> <u>(m)</u>	<u>Direction</u>	<u>Vegetation</u>	<u>Survey</u> <u>Methods</u>	<u>Recent</u> <u>Use</u>	<u>Previous</u> <u>Impacts</u>
1A 1B 1C 1D	1000	S-N	cypress, oak, hackberry, sweetgum, hickory, palmetto, scrub, grasses, vines, poison ivy, blood- weed, briars	pedestrian	pasture	parish levee construc- tion, pasture maintenance, road building, drainage ditch, pipeline laying
2A 2B 2C 2D	1000	S-N	cypress, oak, hackberry, sweetgum, hickory, palmetto, scrub, grasses, vines, poison ivy, blood- weed, briars	pedestrian	pasture, woods, swamp	parish levee construction, pasture maintenance, road building, drainage ditch, pipeline laying, ranch outbuilding
3A 3B 3C 3D	1000	S-N	cypress, willow, lillies, hyacinth, duckweed	pedestrian	swamp	levee construction
4A 4B 4C 4D	1000	S-N	cypress, willow, oak, gum, hackberry, blood- weed, grasses, palmetto	pedestrian	pasture/ woods	pasture clearing, levee construction
5A 5B 5C 5D	1000	S-N	cypress, willow, oak, gum, hackberry, blood- weed, grasses, palmetto	pedestrian	pasture/ swamp	levee construction, pasture clearing, spoil bank of ditch

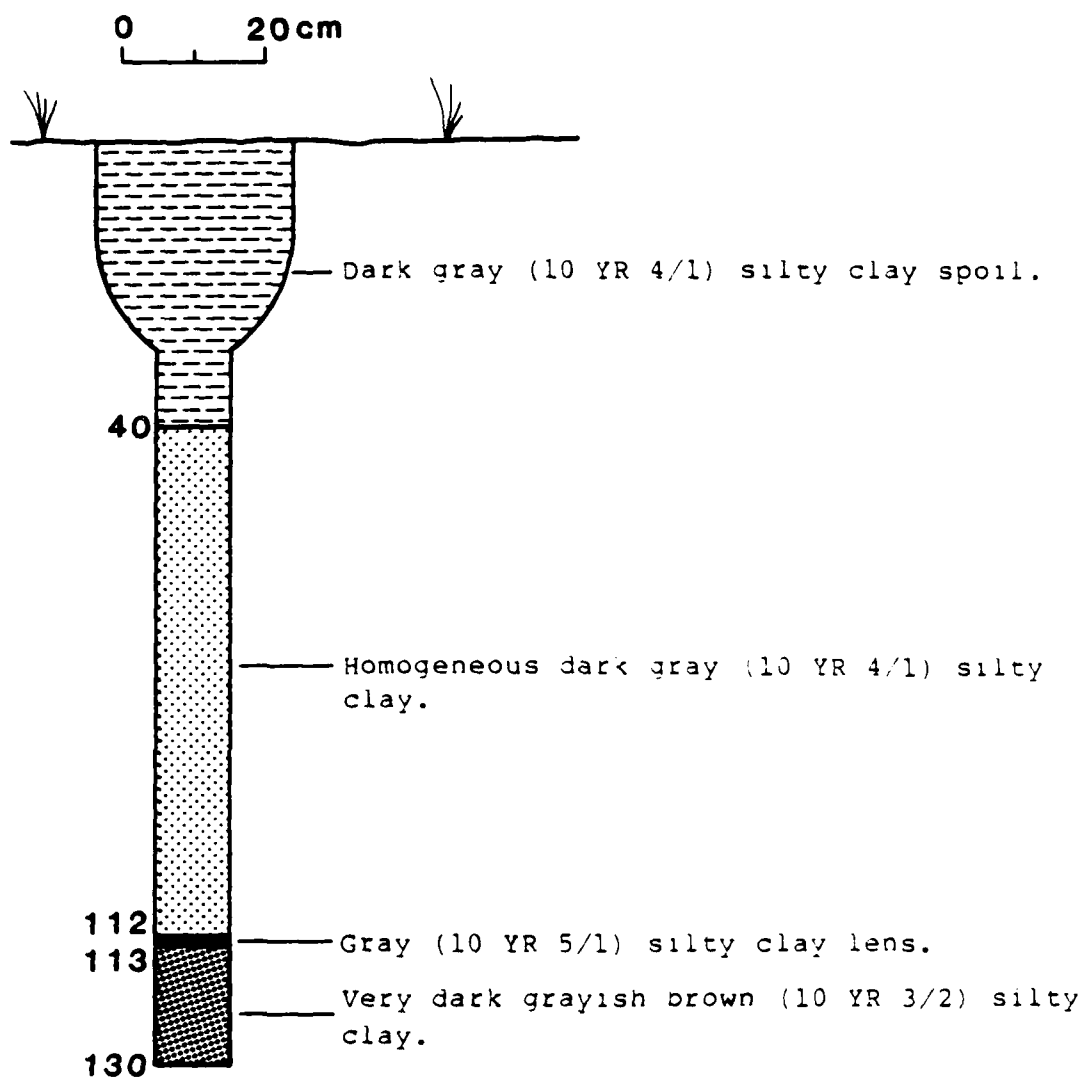


Figure 10. Profile of Auger Test 1, Section C North, Transect 1.

The fourth transect in Section C North began on dry land. The first portion of the transect was in seasonally wet woods; however, it presently crossed over into pasture. The tests continued to reveal the same soils as displayed in Figure 10, with the addition of a very dark gray (10 YR 3/1) silty clay in parts of the pasture.

The fifth transect reached the end of the pasture, and entered into untestable swamp. The pasture contained the same soils as the previous transects. The swamp came to an end at the 40 Arpent Canal Pumping Station to Bayou Blue Canal. The transect then changed its bearing to follow the Bayou Blue Canal northeastward. This portion of Transect 5 lies well below (one meter minimum) the natural water level. The results of the soil tests in the pasture here were indicative of spoil deposits.

Transect 6 continued on this new bearing through open woodland and pasture. This transect crossed over the remains of Hospital Bayou. The bayou is dry now since the levee has cut off its origin, but it is clearly identifiable by its channel depression and bank line deposits. Figure 11 depicts an auger test on the southern bank of Hospital Bayou. Subsurface tests throughout this transect revealed the same clays as previous transects.

Transect 7, the last within the project corridor, was only 200 meters long. It continued in the same pasture as Transect 6, and yielded the same soil types as Transect 6.

Section C South

Following Section C North, Section C South was surveyed (Table 5). For most of its length, access to this transect was by boat. This section lies entirely on the protected side of the levee. Starting at Bully Camp, at the southern end of Section C South, the first transect passed through a considerable amount of freshwater marsh. This area was thickly covered with willow, marsh elder, bloodweed, and grasses. Most of the dry portions of this area were spoil deposits. An auger test conducted in this transect revealed homogeneous deposits of silty clay below spoil (Figure 12). The more northern portion of the transect continued through abandoned pastures or fields, generally overgrown with bloodweed.

The second transect in Section C South continued the findings of the first transect. The surface deposits indicated spoil, probably resulting from first lift levee construction. Much of the survey corridor in this transect passed through cleared or overgrown pastures. Spoil banks resulting from drainage ditch

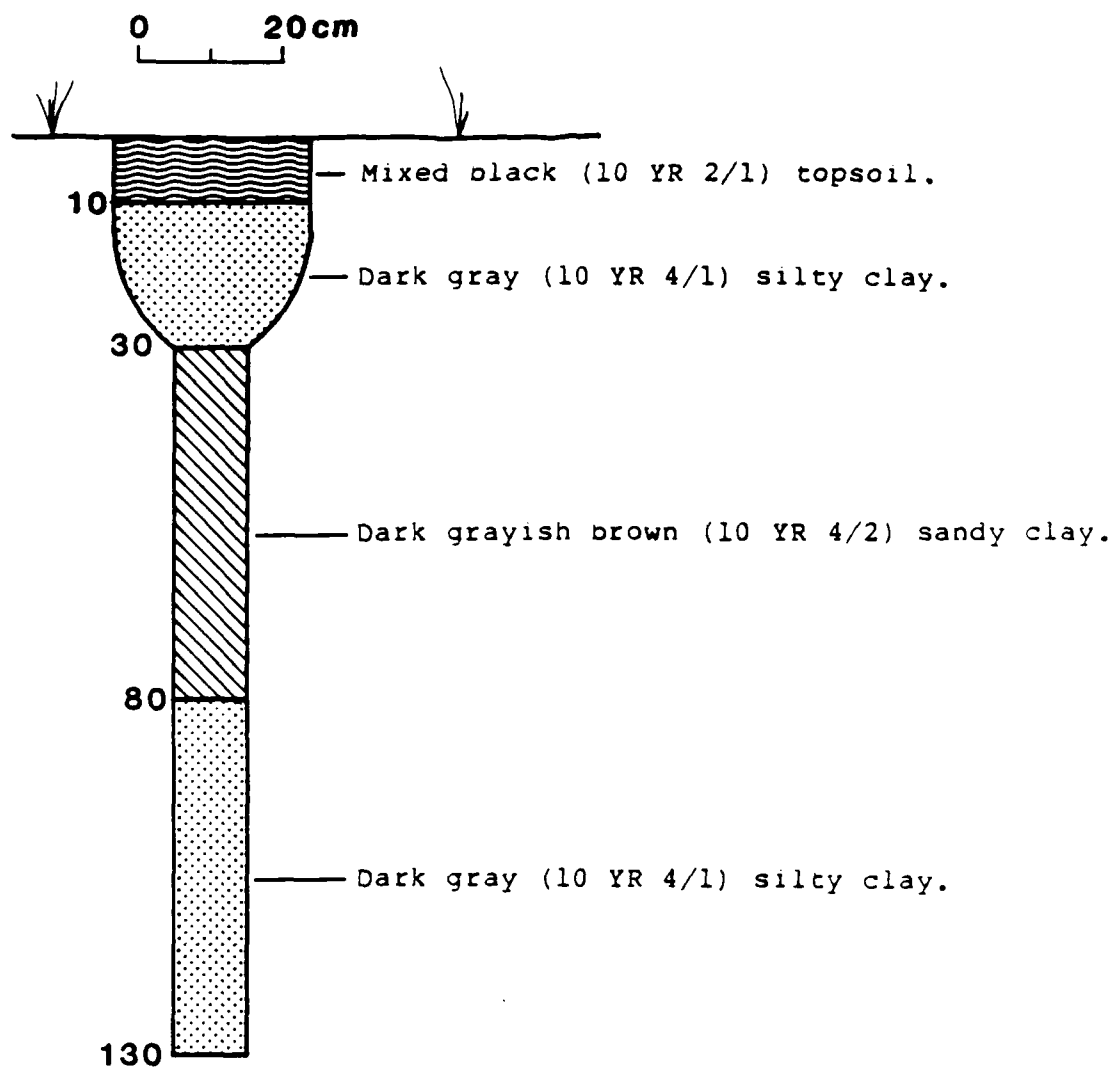


Figure 11. Profile of Auger Test 4, Section C North, Transect 6, Locus C.

Table 5. Synopsis of Transect Data, Section C South.

<u>Transect No./</u> <u>Locus</u> <u>Designation</u>	<u>Length</u> <u>(m)</u>	<u>Direction</u>	<u>Vegetation</u>	<u>Survey</u> <u>Methods</u>	<u>Recent Use</u>	<u>Previous Impacts</u>
1	1000	S-N	bloodweed, willow, marsh elder	boat	pasture/ marsh	Corps levee construction, parish levee construction, pasture clearing, drainage ditches, shell road
2	1000	S-N	bloodweed, willow, marsh elder	boat	pasture/ marsh	Corps levee construction, parish levee construction, pasture clearing, drainage ditches
3	1000	S-N	bloodweed, willow, marsh elder	boat	pasture/ marsh	Corps levee construction, parish levee construction, pasture clearing, drainage ditches
4	1000	S-N	bloodweed, willow, marsh elder	boat	pasture/ marsh	Corps levee construction, parish levee construction, pasture clearing, drainage ditches
5	1000	S-N	bloodweed, willow, marsh elder	boat	pasture/ marsh	Corps levee construction, parish levee construction, pasture clearing, drainage ditches
6	1000	S-N	bloodweed, willow, marsh elder	boat/ pedes- trian	pasture/ marsh	Corps levee construction, parish levee construction, pasture clearing, drainage ditches
7	1000	S-N	bloodweed, willow, marsh elder	pedes- trian	pasture/ marsh	Corps levee construction, parish levee construction, pasture clearing, drainage ditches

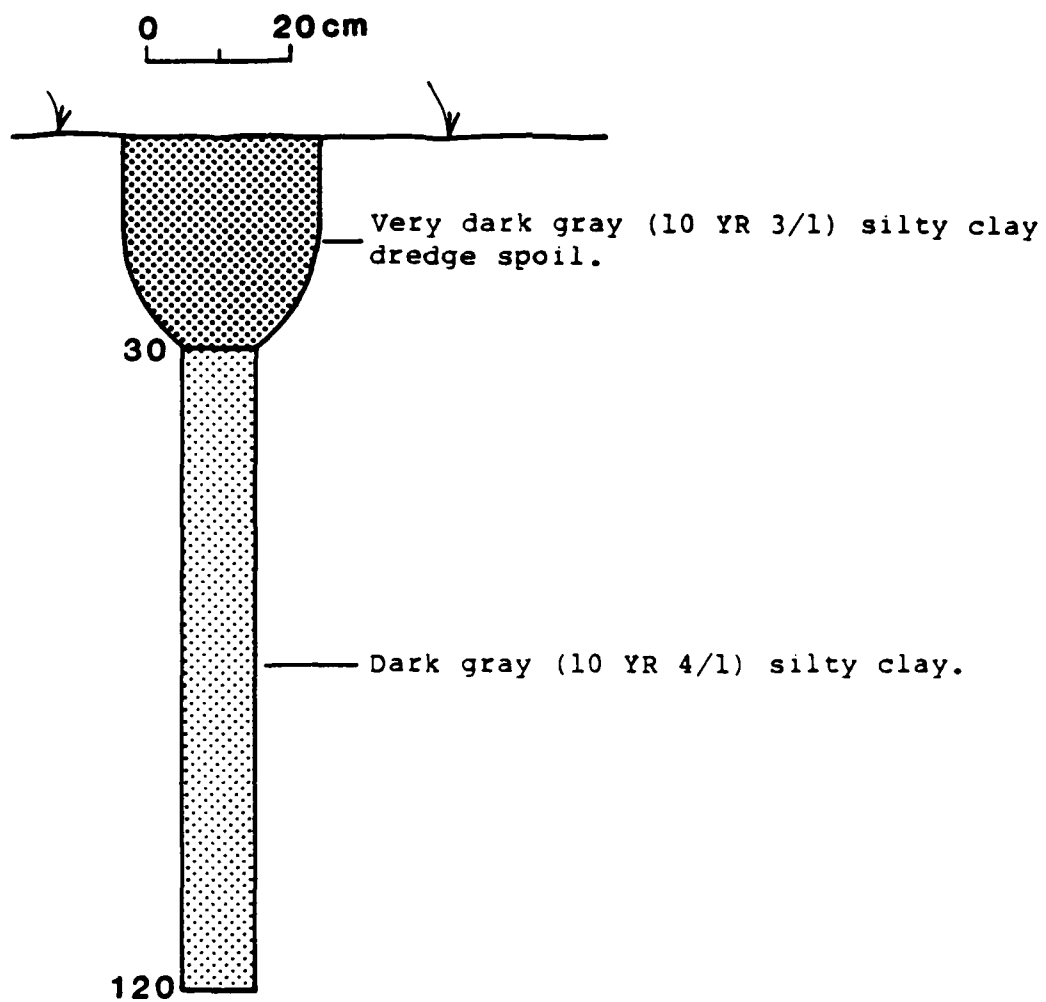


Figure 12. Profile of Auger Test 10, Section C South, Transect 1.

construction were also present.

Transect 3 continued the results of the previous transects. Most of the tests were excavated within overgrown pastures or pastures that currently are cleared. Soils revealed through subsurface testing were consistent with those observed in previous transects. Transects 4 and 5 continued northward without any deviation from the earlier transects. Subsurface tests were conducted at 50-meter intervals. The corridor remained within cleared or overgrown fields and pastures.

Transect 6 was the last transect of Section C South that was surveyed by boat. The subsurface test results along this transect concurred with the results of subsurface tests conducted in earlier transects. Islands in the borrow pond in this transect, as well as the five preceding it, proved to be remnants of the parish levee system. This conclusion was reached based on their shape (steep sided with narrow crown) and the composition of the soils (all spoil).

Transect 7, the last transect of Section C South, was investigated by pedestrian survey. All subsurface tests were conducted within pastures that either were in use currently, or were abandoned and covered with thick growths of bloodweed and other fast growing, sun-loving plants. These tests produced results identical to those described above for the previous transects.

Section B North

This section consisted of nine transects. Shovel tests were conducted every 50 meters. The direction of examination was north to south (Table 6). Transect 1 began south of the Bully Camp shell road. This is the location of the levee blow-out in 1985. This blow-out flooded the area south of Bully Camp for a considerable period of time. Subsurface tests in this transect, as well as several to the south, revealed a layer of gray (10 YR 5/1) silt that probably results from this crevasse episode. This portion of the survey corridor runs across the base of a number of fields and pastures frequently cut with drainage ditches. The shovel tests were conducted at the base of these pastures. The subsurface test results from Transect 2 conformed with those from Transect 1. These tests continued to be placed at the foot of the cleared or overgrown pastures. In places, the old parish levee still exists in the borrow ponds.

Transect 3 continued the trend of the previous transects. These tests were conducted in pastures along the borrow ponds. The parish levee is still extant in some of these areas.

Table 6. Synopsis of Transect Data, Section B North.

<u>Transect No./Locus Designation</u>	<u>Length (m)</u>	<u>Direction</u>	<u>Vegetation</u>	<u>Survey Methods</u>	<u>Recent Use</u>	<u>Previous Impacts</u>
1	1000	N-S	willow, bloodweed, tallowberry	boat	pasture	clearing for pasture, drainage ditches, parish levee construction, Corps levee, 1985 levee blowout
2	1000	N-S	willow, bloodweed, marsh elder, grasses	boat	pasture	clearing for pasture, drainage ditches, parish levee construction, Corps levee const., 1985 levee blowout
3	1000	N-S	willow, bloodweed, marsh elder, grasses	boat	pasture	clearing for pasture, drainage ditches, parish levee construction, Corps levee const., 1985 levee blowout
4	1000	N-S	willow, bloodweed, tallowberry, marsh elder, grasses, rushes	boat	pasture	clearing for pasture, drainage ditches, parish levee, Corps levee construction
5	1000	N-S	willow, bloodweed, marsh elder, grasses, rushes	boat	pasture	pasture clearing, drainage ditches, parish levee construction, Corps levee construction
6	1000	N-S	willow, bloodweed, marsh elder, grasses, rushes, tallowberry	boat	pasture	pasture clearing, drainage ditches, parish levee construction, Corps levee construction
7	1000	N-S	willow, bloodweed, marsh elder, grasses, rushes, tallowberry	boat	pasture	pasture clearing, drainage ditches, parish levee construction, Corps levee construction
8	1000	N-S	willow, bloodweed, marsh elder, rushes, grasses	boat	pasture	pasture clearing, drainage ditches, parish levee construction, Corps levee construction
9	150	N-S	willow, bloodweed, marsh elder, rushes, grasses	boat	pasture	pasture clearing, drainage ditches, parish levee construction, Corps levee construction

Subsurface tests in Transects 4 and 5 produced the same results as described above, except the gray silt became less frequent. The remains of the parish levee were visible, continuing 200 meters into Transect 6.

Transect 6 began with traces of the parish levee, but these terminated at Shovel Test 4 (200 meters). From this point south, the borrow ponds were wider. Subsurface testing continued to reveal the same soils as described for more northern transects. The tests continued to be placed at the base of pastures.

Transects 7 and 8 continued the trend of previous transects. No differences in soils or terrain were recognized. Transect 9 was only 150 meters long; however, it did not differ from earlier transects. An auger test revealed clay deposits overlain by a series of spoil deposits (Figure 13).

The Boudreaux Site (16 LF 99)

While no sites were discovered in the project corridor, one previously recorded site was visited to provide better information on the nature of prehistoric sites in the vicinity of the project area. The Boudreaux site (16 LF 99) was recorded originally in 1978 by Philip Rivet, Office of the State Archeologist of Louisiana, on the basis of information and collections provided by Terry Boudreaux, then of Galliano, Louisiana. Boudreaux's collections were examined and described as containing ceramics associated with the Plaquemine phase of the Mississippian period (Types included Avoyelles Punctated var. Dupree, Baytown Plain var. Addis, L'Eau Noire Incised var. Anna, Leland Incised var. Fatherland, Leland Incised var. unspecified, Maddox Engraved var. unspecified, and Mazique Incised var. Manchac), historic trade beads (n=2), bone (representing human, deer, muskrat, alligator, and choupique), freshwater shell, and recent metal scraps. Initial assessments of the site based on these remains and Boudreaux's descriptions suggested that the site represented a Plaquemine phase village.

After the completion of the current fieldwork for the Larose to Golden Meadow Hurricane Protection Project, the site was visited in an effort to verify the earlier assessments of site location and function and to provide some idea of site size, condition, and internal artifact distributions. This visit represented the first examination of the site by a trained archeologist.

The site presently lies in a wooded area and pasture southwest of LA 1 and West 103rd Street near Cut Off, Louisiana. It is approximately 1550 meters due east of the project area. A fence

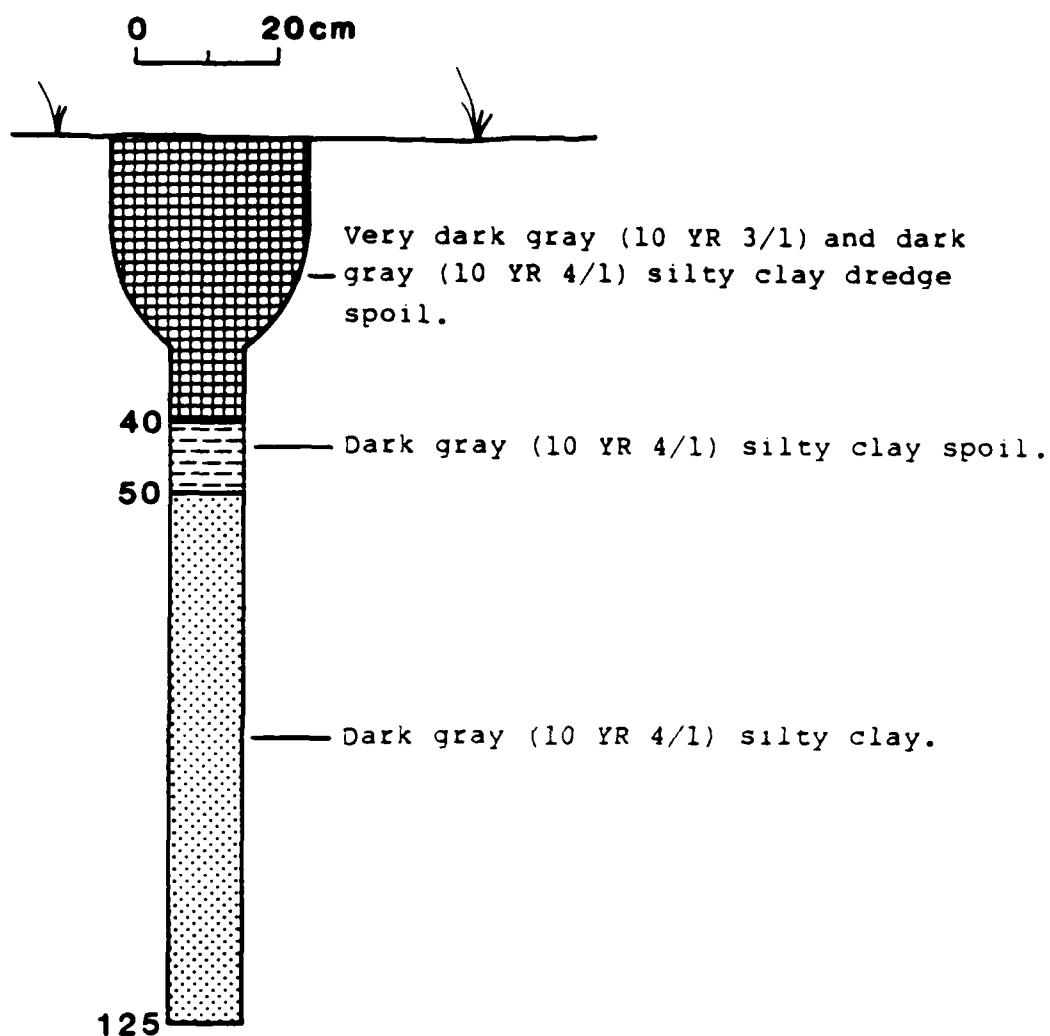


Figure 13. Profile of Auger Test 2, Section B North, Transect 9.

and ditch partition the site in a northeast to southwest direction (bearing 220°). The wooded area lies to the southeast side of the fence/ditch, while the pasture occupies the area northwest of the fence/ditch (see Figure 14). These structures represent the modern property lines. Right of entry was obtained for the southeast portion of the site through the kind permission of the landowner, Mr. George Hebert, prior to the visit by the field crew. Access to the northwest portion could not be acquired for the northern area due to the absence of the landowner. Subsurface tests were limited, therefore, to the portion of the site where permission to enter had been acquired. All statements concerning the site refer to only this southeastern portion, unless noted otherwise.

The southeastern portion of the site is covered by a dense growth of small trees, vines, and weeds. Varieties include maple, gum, cherry, hackberry, grapevine, and bloodweed. Numerous trails have been cut through this wooded area by nearby residents to provide access for recreational activities (e.g., hunting, crawfishing, "running" dogs). These trails are overgrown with low gourd vines. Surface exposures are scattered through these trails and the wooded areas at infrequent intervals. Most of these areas of exposed surface are small (less than three meters in maximum dimension). Presently, the area to the north of this portion of the site is wooded or occupied by modern residences, while the area to the south is covered by willow thickets and marsh grasses.

The northwestern portion of the site is covered by a pasture. This area contains planted and mowed grasses and a large copse of trees. Arboreal varieties are similar to those described for the other portion of the site. Surface exposures are very small and scattered throughout this portion of the site. The pasture is occupied at present by horses. To the north of this portion of the site are sheds and farm equipment assumed to be employed for managing the pasturage. To the south is a large crawfish pond (50 meters by 100 meters) surrounded by a berm approximately 1.5 meters high and 2.5 meters wide at the base. The fill to construct the berm appears to have been scraped from both the inside of the pond and the areas adjacent to the berm outside the enclosure. This entire area is grassed at present and the pond is dry.

All of the small surface exposures in both portions of the site were examined for archeological remains. In addition, the banks of the ditch were examined for the possible exposure of buried deposits. Sherds and shell were found in exposures adjacent to the ditch in the southeast portion of the site and on spoil and in the ditch bank in the northwest portion of the site. All the ceramic materials were collected. One small lens of shell (approximately 30 centimeters long and five centimeters thick) was

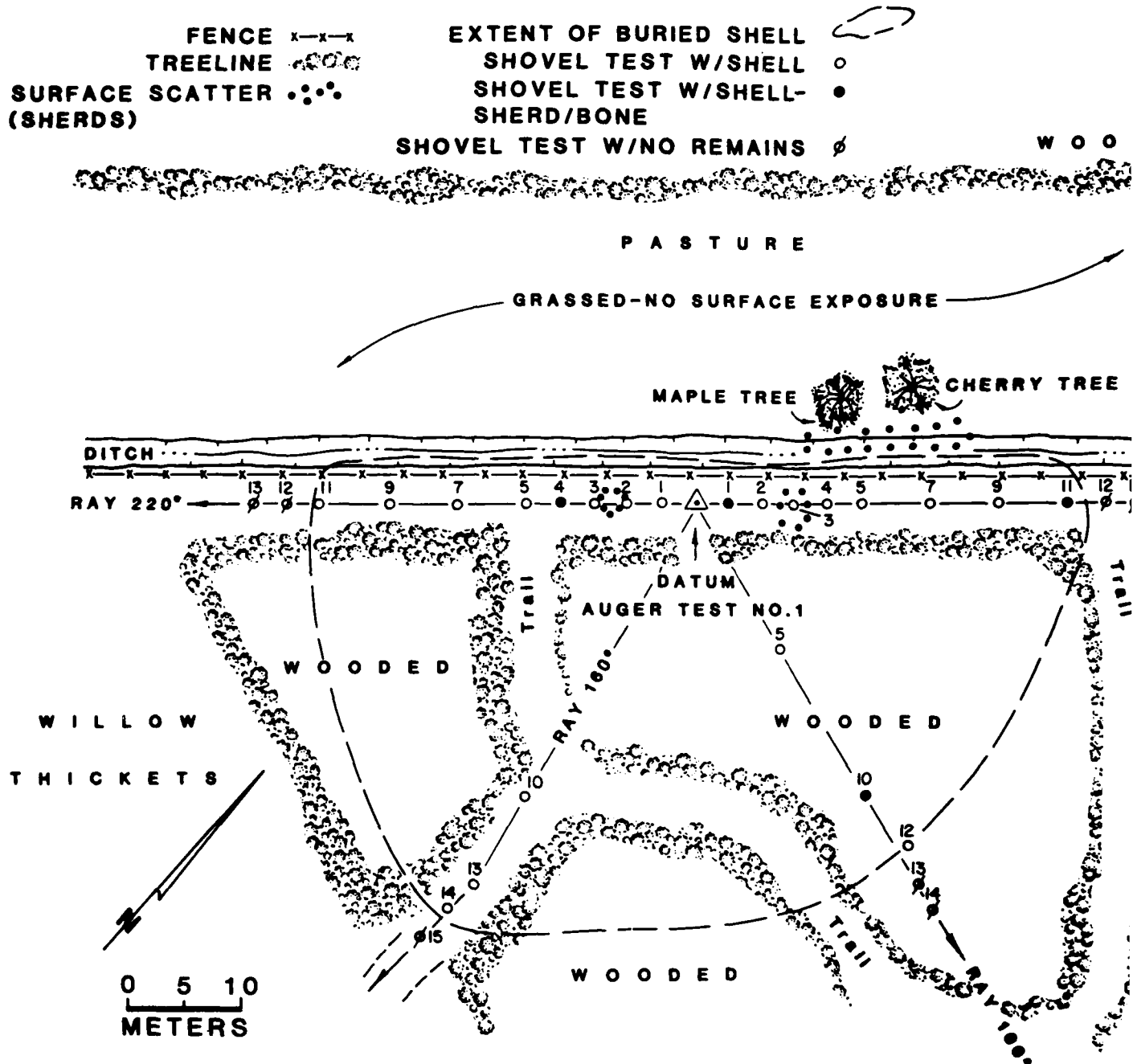
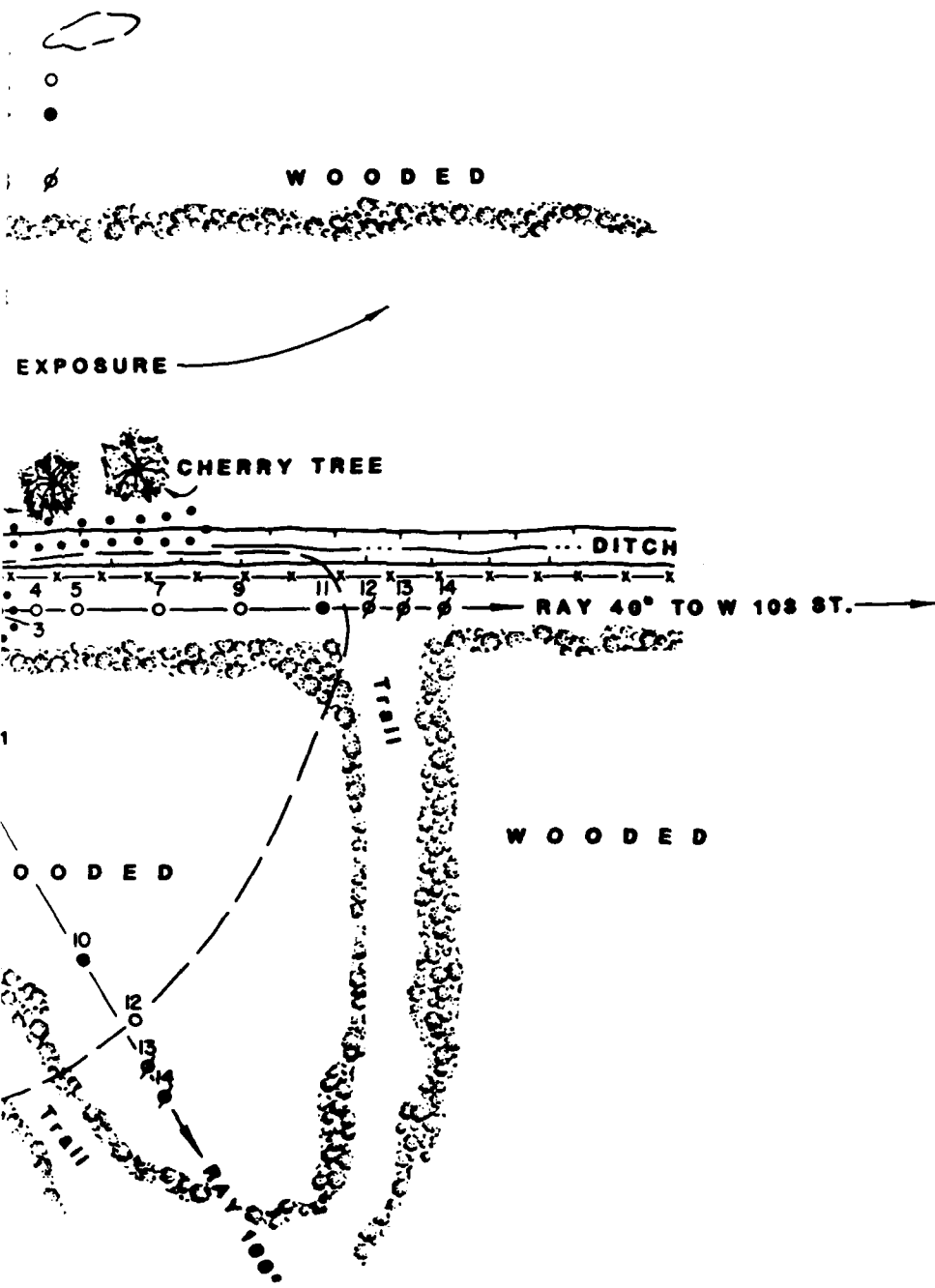


Figure 14. Sketch map of the Boudreaux site (16 LF 99).



observed in the southeast bank of the ditch at the approximate center of the surface scatter of materials. This lens was approximately 50 centimeters below the ground surface.

Four alignments of shovel tests were placed over the southeast portion of the site. These rays emanated from a temporary datum established at the approximate center of the surface distribution of materials. Shovel tests were excavated at three meter intervals along these rays until no buried cultural materials were encountered. Beyond fifteen meters from the datum, tests were spaced at six-meter intervals until no buried materials were encountered. Tests at three-meter intervals were spaced around these empty shovel tests to ensure that the edge of the buried deposits had been encountered. The location of these tests are displayed in Figure 14.

An initial test (Auger Test 1) was excavated at the datum to provide a control exposure for the other tests. The soil profile from this test and all others revealed that the soils were identical in color (very dark gray--10 YR 3/1) from the ground surface to the water table (0 to 84 centimeters below surface). Three distinct textures were evident, however, through this section. The upper ten centimeters of soil represented a clay loam with some organic components. This topsoil was underlain by approximately twenty centimeters of compacted clay (10 to 30 centimeters below surface). Underneath the clay horizon was a silty clay which contained a lens of shell, bone, and ceramic debris approximately ten centimeters thick. This lens occurred at depths of 35 to 45 centimeters below the ground surface within the tested portions of the site. No discoloration of the matrix surrounding this lens was observed in any of the excavated shovel tests. Figure 15 displays this soil profile.

Ceramic or faunal remains were found in association with the shell lens in four of the shovel tests. The extent of buried cultural remains was assumed to equate with the extent of the shell lens given the noted association of the materials. In addition, the surface scatter of ceramics occurred within a surface scatter of shell. The extent of the shell scatter approximated the extent of the buried lens of shell and cultural debris.

The materials collected during this visit included twelve ceramic sherds, two bone fragments, and approximately two kilograms of shell. All of the observed and collected shell are Rangia cuneata. One of the bone fragments is fish (species and element unknown) and the other is unidentified. The ceramic sherds are all plainwares with a single exception. One sherd displays a curvilinear incision paralleled by small punctations. The plainwares are assumed to represent Baytown Plain var. Addis, while the decorated sherd appears similar to Coleman Incised or

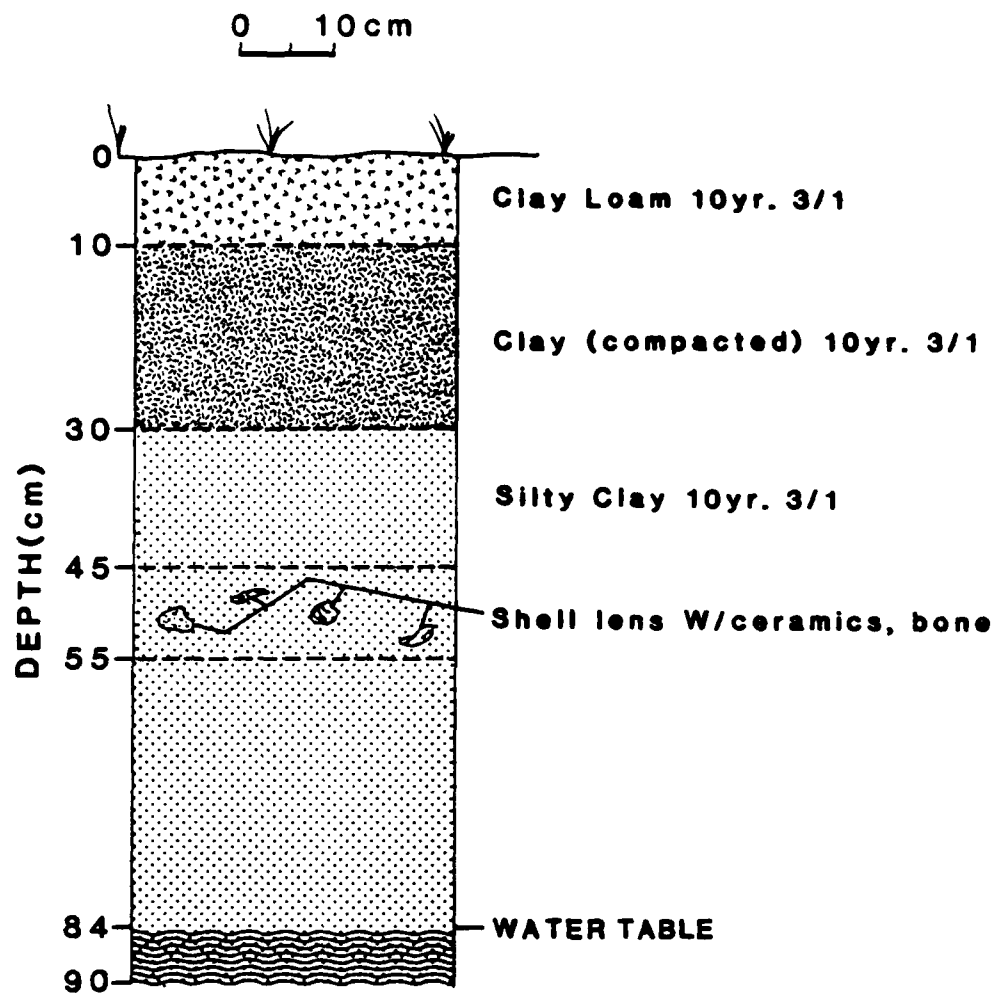


Figure 15. Profile of Shovel Test 1, Ray 220°, at the Boudreaux site (16 LF 99).

Owens Punctated (Phillips 1970).

While travelling to the site, the crew encountered Mr. Rousseau Dardar, a resident of West 103rd Street, Cut Off, Louisiana. Mr. Dardar provided additional background information concerning the site. The ditch which subdivides the site was excavated approximately seven to eight years ago (1978-1979). Boudreaux, Dardar, and other local residents began to collect artifactual remains from the spoil which resulted from the construction of this ditch. No materials had been noted prior to this excavation. Also, according to Mr. Dardar, the site was originally in a swampy area when he first moved to West 103rd Street (approximately 13 years ago - 1973). Only after the area had been drained to permit highway construction did the water table reach its present level.

The results of the examinations of 16 LF 99 conducted during this project suggest that this site is a shell midden associated with the Plaquemine phase of the Mississippian period. The site consists of a lens of shell, ceramic, and faunal remains approximately ten centimeters thick. This lens lies between 35 and 45 centimeters below the present ground surface. The site has been disturbed by the construction of a ditch and fence through the site (from northeast to southwest). This disturbance permitted the discovery of the site by local residents. Subsequent impacts have been limited to pedestrian activities and overall subsidence of the region. Future impacts may include the construction of a four-lane highway through the area.

CHAPTER VII

THE EFFECTS OF PREVIOUS IMPACTS ON THE ARCHEOLOGICAL RESOURCE BASE

Previous possible impacts to the archeological resource base of the survey area have resulted from levee construction, oil exploration and extraction, highway construction, and local drainage improvement projects such as ditches and canals. In addition, excessive flooding has occurred in portions of the survey area as a result of a levee breach in 1985. Each of these ground altering activities presents varied opportunities for adverse impacts to any archeological resources within its venue. These probable adverse effects are described briefly with respect to the particular levee sections.

Levee construction and highway construction provided the greatest opportunity for adverse impacts to archeological resources. Such activities involved the movement of large amounts of earth to support or comprise the particular structure. Construction activities such as these resulted in the formation of large borrow areas which, in the project area, fill with water. In addition, the structures (i.e., levees or roadways) occupy areas which have been excavated and/or reworked to consolidate the structural substrate. Archeological remains located within areas of this kind would be in danger of destruction and/or relocation.

Another source of impact resulted from the deposition of spoil over the contemporary ground surface. While spoil deposits do not affect archeological remains in the same manner as borrow or construction activities, the placement of thirty or more centimeters of displaced alluvial material would have concealed effectively any archeological resources. While not actually removing an archeological site or portions of its content, the placement of substantial quantities of debris on top of a site may have reduced its probability of discovery below the threshold of current standard recovery techniques used during a typical pedestrian survey.

Ground disturbing activities associated with levee construction have taken place within all sections of the present project corridor. In Sections A West, B South, B North, and C South, two sets of levee construction have occurred. Initial levee construction occurred during the 1960s with the development of the parish levee system. Further levee construction activities can be related to the New Orleans District, U. S. Army Corps of Engineers, Larose to Golden Meadow Hurricane Protection Project. This first lift levee construction affected a much wider

area than the earlier levee system. Therefore, a wider area of previous probable impacts exists within Sections A West, B South, B North, and C South. Section C North has experienced impacts related to the construction of the parish levee system only. Highway construction has occurred within Section A West only.

Ground disturbing activities associated with oil exploration and extraction have included well drilling, drill pad construction, the construction of access roads, and the development of pipelines and storage facilities. These activities may have resulted in disturbances to both surface and subsurface archeological remains. The effects of these activities on archeological materials would include the displacement or destruction of cultural deposits. Section B South experienced the greatest amount of probable impacts from this source. In addition, Sections C South and C North experienced activities related to the construction of a subsurface pipeline.

Efforts to improve local drainage conditions involved the excavation of ditches or canals with the accompanying deposition of spoil. While most of these efforts have been limited in size and scope (most of the observed drainage canals are less than two meters in depth and width), these excavations have probably disturbed portions of intact cultural deposits. This disturbance may have been so extensive as to have destroyed the integrity of the affected site.

As a result of improved drainage, much of the previously wooded areas along the survey corridor has been exposed to land clearance. The use of heavy equipment to clear land of its earlier vegetative cover would have resulted in disturbances to any surface-occurring archeological remains within the affected area.

In Section B North, a levee breach occurred in 1985 which caused extensive flooding in this section. Flooding resulted in the deposition of varied alluvial materials which would probably contribute to the burying of archeological materials. If similar flooding events occurred frequently, archeological remains could be obscured sufficiently to prevent their identification. While not actually destroying a site, such occurrences would make archeological resources undiscoverable and therefore, in essence, lost. Undoubtedly, flood episodes such as this occurred throughout the survey area in the past.

In summary, five types of impacts have occurred within the project corridor, and are listed below in order of their probability for adverse effects to the archeological resource base. Probable impacts include: levee construction, highway construction, oil exploration and extraction, drainage

improvement activities, and natural depositional events. The ground disturbing impacts observed in each section include: Section A West (levee construction, highway construction, and drainage improvements), Section B South (levee construction, oil exploration and extraction, drainage and improvements), Section B North (levee construction, drainage improvements, and natural deposition), Section C South (levee construction, oil extraction, and drainage improvements), and Section C North (limited levee construction, oil extraction, and drainage improvements).

The lack of archeological materials within the survey corridor suggests that the effects of earlier impacts have been either non-existent or highly adverse. In theory, if the lack of archeological sites recovered during the survey represents the actual paucity of archeological remains within the survey area, no previous impacts have occurred to the resource base. Consequently, assuming a site was contained entirely within the borrow and construction area of the levee, construction impacts would have resulted in its complete destruction. Given the predicted small size of most sites in the project area, such impacts probably have occurred. These adverse effects represent a hypothesis since no evidence of previously intact archeological remains has been observed in the examined portions of the project area.

The digging of drainage ditches, while it may have an impact on the integrity of subsurface materials, also may bring deeply buried materials to the surface. All available exposures of this nature within the survey corridor have been examined. In all cases, these features failed to reveal indications of cultural remains.

Other past and continuing impacts within the survey corridor, such as road building, pasture clearing, logging, and oil extraction, are not likely to have disturbed deeply buried deposits. However, they do have a very high probability of having eliminated or altered any surface or near surface indications of cultural materials. The lack of any such remains within the project corridor demonstrated that these impacts have been minimal.

CHAPTER VIII

CONCLUSIONS AND RECOMMENDATIONS

The potential range of cultural resources in the lower Bayou Lafourche area is substantial. There exists potential for prehistoric remains dating from the Tchefuncte through the Mississippian periods, as well as for historic remains from as early as the first half of the nineteenth century. While this cultural resources survey was based on a probabilistic, site-predictive model outlining areas of high and low resource potential, the fact that it did not recover or identify any prehistoric or historic sites in no way invalidates the model. Indeed, based on the pre-levee construction environment, most of the area was characterized by freshwater marsh. This marsh would not be an optimal environment for settlement and therefore would not be an optimum site location. Other portions of the project area are swamp, and therefore would be low probability settlement areas.

The relict drainages and distributaries within the corridor generally are quite small and rather ephemeral. These would not be good habitation sites; indeed, it is questionable whether many of them would have extended above the water surface. By way of contrast, the natural levees of Bayou Lafourche, while by no means extensive in the project area, are known to contain at least one, and possibly more, prehistoric sites. Until levee construction began in the 1960s, only the small natural levees were not part of the swamp, and were suitable for habitation. Therefore, site density would be expected to be very low in the marsh and swamp areas of the project corridor, i.e., throughout most of the corridor. This is in accordance with the results of the field survey.

Recommendations

While levee construction activities have the potential to produce drastic adverse impacts on archeological resources, the failure of the survey to discover any cultural remains within the project corridor suggests that no impacts will occur within these specific project corridors. The presence of deeply buried archeological sites within the corridor, undiscovered by the recovery techniques employed, is possible given the predicted human activities expected to have occurred in this region and its active depositional condition. Given the small size expected for most of the sites reflecting these activities, the destruction or the complete removal (i.e., through burial below extensive spoil deposits) of these sites from the archeological resource base

would produce the most adverse of impacts definable within the project area. The loss of these small sites has the potential to remove one element of the overall subsistence strategies of both prehistoric and historic peoples from the archeological resource base. It is with this possibility in mind that we recommend proceeding with the proposed work as scheduled; however, standard caution should be exercised that, in the event unidentified resources are exposed, a proper archeological assessment of their significance can be conducted.

Further survey or analysis is not recommended within the present project corridor. Given the kinds of archeological resources expected to exist within the deltaic marshes and swamps of the Bayou Lafourche region, however, settings in the greater project area which may experience similar impacts should be examined. Areas to the west of Bayou Lafourche, where higher densities of archeological sites are evident, should be examined if exposed to potential sources of impact. Areas with a probability for containing archeological sites, such as along the natural levees of existing streams or along relict distributaries, also should receive particular emphasis in any future survey efforts.

REFERENCES CITED

- Bank of Houma
1910 Waterways Edition. A Sketch of the Louisiana Intercoastal Canal Route from Morgan City to New Orleans via Houma and Lockport. Bank of Houma, Houma, Louisiana.
- Beavers, Richard C., T.R. Lamb and J.R. Green
1984 Archaeological Survey of the Upper Lafourche Delta. Archaeological and Cultural Research Program, Research Report No. 8, University of New Orleans.
- Bowie, Helen
1935 Bayou Lafourche. Unpublished Masters Thesis, Louisiana State University, Baton Rouge.
- Brown, Ian W.
1984 Late prehistory in coastal Louisiana: the Coles Creek period. In Perspectives on Gulf Coast Prehistory, edited by Dave D. Davis, pp. 94-124. Florida State Museum, Gainesville.
- Brown, Ian W., Richard S. Fuller, and Nancy Lambert-Brown
1979 Site survey in the Petite Anse Region, Southwest coast, Louisiana. Lower Mississippi Survey, Petite Anse Project Research Notes II. Peabody Museum, Harvard University.
- Byrd, Kathleen
1974 Tchefuncte subsistence patterns: Morton shell mound, Iberia Parish, Louisiana. Unpublished M.A. thesis, Louisiana State University.
- 1976 Brackish water clam (*Rangia cuneata*): Prehistoric "staff of life" or a minor food resource? Louisiana Archeology 3:23-31.
- Claassen, Cheryl
1986 Shell fishing seasons in the prehistoric southeastern United States. American Antiquity 51:21-37.
- Coleman, James M. and Sherwood M. Gagliano
1964 Cyclic Sedimentation in the Mississippi River Deltaic Plain. Gulf Coast Association of Geological Societies Transactions. 14:67-80. Publishing Division, Baton Rouge.

- Davis, Edwin Adams
 1971 Louisiana: A Narrative History. Third Edition. Claitor's Publishing Division, Baton Rouge.
- Davis, Dave D. (editor)
 1984 Perspectives on Gulf Coast Prehistory, Florida State Museum, Gainesville.
- Fisk, Harold N.
 1944 Geologic Investigations of the Alluvial Valley of the Lower Mississippi River. Mississippi River Commission, U.S. Army Corps of Engineers, Vicksburg.
- Fisk, Harold N. and Bramlette McClelland
 1959 Geology of Continental Shelf off Louisiana: its influence on offshore foundation design. Geological Society of America Bulletin 70:1369-1394.
- Ford, James A., and Gordon Willey
 1940 Crooks Site, Marksville Period Burial Mound in LaSalle Parish, Louisiana. Department of Conservation, Louisiana Geological Survey, Anthropological Study 3.
- Frazier, D.E.
 1967 Recent Deltaic Deposits of the Mississippi River, Their Development and Chronology. Gulf Coast Association, Geological Society Transaction 17:287-315.
- Gagliano, S.M., Weinstein, R.A., and Burden, E.K.
 1975 Archaeological Investigations along the Gulf Intercoastal Waterway, Coastal Louisiana Area. Manuscript prepared for the U.S. Army Corps of Engineers, New Orleans District.
- Gagliano, S.M., R. Weinstein, E. Burden, K. Brooks and W. Glauder
 1979 Cultural Resources Survey of the Barataria, Segnette and Rigaud Waterways. Coastal Environments, Inc., Baton Rouge. Submitted to U.S. Army Corps of Engineers, New Orleans District.
- Gibson, Jon L.
 1978 A Cultural Resources Survey of LL & E Realignment and Clovelly Farms, Lafourche Parish, South Louisiana. Manuscript prepared for the U.S. Army Corps of Engineers, New Orleans District.

- 1982 Archeology and Ethnology on the Edges of the Atchafalaya Basin, South Central Louisiana. Submitted to the Department of Army, New Orleans District Corps of Engineers, Contract No. DACW29-79-C-0265.
- Goodwin, R. Christopher
1986 Archeological Testing at 16CM61, a Prehistoric Shell Midden in Cameron Parish, Louisiana. Final Report submitted to the New Orleans District, U. S. Army Corps of Engineers.
- Goodwin, R. Christopher, Galloway Walker Selby, and Laura Landry
1984 Evaluation of the National Register Eligibility of the M/V Fox, an Historic Boat in Lafourche Parish, Louisiana. Submitted to the U.S. Army Corps of Engineers, New Orleans District.
- Goodwin, R. Christopher, and Galloway Walker Selby
1984 Historic American Engineering Record Recordation of the M/V Fox, A National Register Eligible Boat in Lafourche Parish, Louisiana. Submitted to the U. S. Army, Corps of Engineers, New Orleans District.
- 1985 Cultural Resources Survey of the Proposed 30" Pipeline from Larose to Paradis, St. Charles and Lafourche Parishes. Report submitted to the Riverway Gas Pipeline Company, New Orleans, Louisiana.
- Goodwin, R. Christopher, Jill-Karen Yakubik, Galloway W. Selby, and Kenneth R. Jones
1985 Cultural Resources Survey of the Morgan City and Vicinity Hurricane Protection Project. Submitted to the Department of the Army, New Orleans District, Corps of Engineers, Contract No. DACW-84-29-0029. Copies available through National Technical Information Service, Springfield, VA 22161.
- Gould, H.R.
1970 The Mississippi Delta Complex. In Deltaic Sedimentation Modern and Ancient, edited by James P. Morgan. Society of Economic Paleontology and Mineralogy, Special Publication #15, Tulsa.
- Knipmeyer, William B.
1956 Settlement Succession in Eastern French Louisiana. Unpublished doctoral dissertation, Louisiana State University, Baton Rouge. University Microfilms International, Ann Arbor, Michigan.

- Kolb, Charles and J. Van Lopik
 1958 Geology of the Mississippi River Deltaic Plain Southeast Louisiana. Technical Report No. 3-483, Vol. III, Vicksburg.
- LATELCO
 1980 The Longest Street. A Story of Lafourche Parish and Grand Isle. Moran Publishing Corporation, Baton Rouge, LA.
- McCullough, David L.
 1984 Cultural Resource Survey of the Section B North/Section B South Gap Closure, Larose to Golden Meadow, Louisiana Project, Lafourche Parish, Louisiana. Manuscript prepared for the U.S. Army Corps of Engineers, New Orleans District.
- McIntire, William G.
 1954 Correlation of Prehistoric Settlements and Delta Development. Coastal Studies Institute, Technical Report No. 5, Louisiana State University, Baton Rouge.
- 1958 Prehistoric Indian Settlements of the Changing Mississippi River Delta. Louisiana State University Press, Baton Rouge.
- McIntire, William G., D.W. Davis, W.H. Conner, R.A. Detro
 1981 A Cultural Resources Survey of the Larose to Golden Meadow Hurricane Protection Levee, Section "F" First Lift and "A" East First Lift. Manuscript prepared for the New Orleans District, Army Corps of Engineers.
- Morgan, James P.
 1974 Recent Geological History of the Timbalier Bay Area and Adjacent Continental Shelf. Melanges No. 9, Museum of Geoscience, Louisiana State University, Baton Rouge.
- Morgan, James P., J.M. Coleman and S.M. Gagliano
 1963 Mudlumps at the Mouth of South Pass, Mississippi River: Sedimentology, Paleontology, Structure, Origin and Relation to Deltaic Process. Coastal Studies Series 10, Louisiana State University Studies, Baton Rouge.
- Neuman, Robert W.
 1984 Louisiana Archeology. Louisiana State University Press, Baton Rouge.

- Phillips, Philip
1970 Archeological Survey of the Lower Yazoo Basin, Mississippi, 1949-1953. Peabody Museum of Archeology and Ethnology, Harvard University Papers 60, Cambridge, Massachusetts.
- Rader, B.F.
1978 Cultural Resources Survey of the Golden Meadow Floodgate Area. Report submitted to the Cultural Resources Planning Section, New Orleans District, U.S. Army Corps of Engineers.
- Raymond, J. Scott
1981 The Maritime Foundations of Andean Civilization: A Reconsideration of the Evidence. American Antiquity 46:806-821.
- Rehder, John B.
1971 Sugar Plantation Settlements of Southern Louisiana: A Cultural Geography. Unpublished dissertation, Louisiana State University, Baton Rouge. University Microfilms International, Ann Arbor, Michigan.
- Ryan, Thomas M. and Dale E. Hicks
1984 A Cultural Resources Survey of Reach E-South Larose to Golden Meadow, Hurricane Protection Project. Manuscript prepared for the New Orleans District, U.S. Army Corps of Engineers.
- Shenkel, J. Richard
1984 Early Woodland in Coastal Louisiana. In Perspectives on Gulf Coast Prehistory, edited by Dave Davis, pp. 41-71. Florida State Museum, Gainesville.
- Smith, L.M., L.D. Britsch and J.B. Dunbar
1985 Geomorphological Investigation of the Atchafalaya Basin, Area West, Atchafalaya Delta, and Terrebonne Marsh. Geotechnical Laboratory and Coastal Engineering Research Center, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. Submitted to U.S. Army Corps of Engineers, New Orleans District.
- Smith, Steven D., Philip G. Rivet, Kathleen M. Byrd, and Nancy W. Hawkins
1983 Louisiana's Comprehensive Archaeology Plan. State of Louisiana, Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge.

- Stout, Michael E., and John W. Muller
1983 Cultural Resources Survey of Larose Floodgate, Larose to Golden Meadow, La., Project, Lafourche Parish, Louisiana. U.S. Army Corps of Engineers, New Orleans District.
- Swanson, Betsy
1975 Historic Jefferson Parish From Shore to Shore. Pelican Publishing Company, Gretna.
- Swanton, John R.
1911 Indian tribes of the Lower Mississippi Valley and Adjacent Coast of the Gulf of Mexico. Smithsonian Institution, Bureau of American Ethnology Bulletin 43.

1946 The Indian Tribes of the Southeastern United States. Smithsonian Institution, Bureau of American Ethnology Bulletin 137.
- Taylor, Joe Grey
1976 Louisiana. W.W. Norton and Company, Inc., New York.
- Toth, Alan
1977 Early Marksville Phases in the Lower Mississippi Valley: A Study of Culture Contact Dynamics. Unpublished doctoral dissertation, Department of Anthropology, Harvard University, Cambridge.
- U.S. Government Printing Office
1874 Annual Report of the Chief of Engineers. U.S. Government Printing Office, Washington, D.C.

1886 Annual Report of the Chief of Engineers. U. S. Government Printing Office, Washington, D.C.

1908 Annual Report of the Chief of Engineers. U.S. Government Printing Office, Washington, D.C.

1914 Annual Report of the Chief of Engineers. U.S. Government Printing Office, Washington, D.C.
- Uzee, Philip D.
1968 Bayou Lafourche. In Rivers and Bayous of Louisiana, edited by Edwin Adams Davis.
- Weinstein, Richard A. and S.M. Gagliano
1984 The Shifting Deltaic Coast of the Lafourche Region and Its Prehistoric Settlement. Manuscript on file at Coastal Environments, Inc., Baton Rouge.

APPENDIX 1

SCOPE OF SERVICES

CULTURAL RESOURCES SURVEY OF WESTERN SECTIONS OF
THE LAROSE TO GOLDEN MEADOW HURRICANE
PROTECTION PROJECT, LAFOURCHE PARISH, LOUISIANA
Contract DACW29-84-D-0029
Delivery Order 0016

1. Introduction. The U.S. Army Corps of Engineers, New Orleans District (NOD), plans to construct a hurricane protection levee in the vicinity of Larose to Golden Meadow, Lafourche Parish, Louisiana (Enclosure 1). This contract will supplement previously conducted cultural resources studies that began in 1978 within the project area and should complete all requisite survey work on the western section of the proposed ring levee. This work item shall consist of an intensive cultural resources survey of the following five levee sections: Section A West, Sections B North and South, and Sections C North and South. All of these sections are located on the west side of the levee system, west of Bayou Lafourche.

2. Project Background. The Larose to Golden Meadow project was authorized by Congress in 1965. This proposed ring levee will protect highly developed residential and commercial areas along Bayou Lafourche between Larose and Golden Meadow in Lafourche Parish, Louisiana, from storm tides and hurricane floodwaters. The overall project involves the enlargement of three miles of existing levees and construction of 38 miles of new levees, 8 miles of low interior levees, two major floodgates in Bayou Lafourche, and several flapgated drainage culverts. Project construction was initiated in 1975 and is currently scheduled for completion in 1994. Although first lift construction has been completed for some of the sections on the western side of the proposed project, no cultural resources investigations have been conducted for these areas. All first levee lifts are complete on the west side except at the extreme northern (Section C North). The U.S. Army Corps of Engineers, New Orleans District, the Louisiana State Historic Preservation Officer, and the Advisory Council on Historic Preservation agreed in the Memorandum of Agreement dated 5 September 84, that the subject undertaking shall be implemented in accordance with certain stipulations in order to take into account the effect of the undertaking on historic properties. Specifically, Stipulation 3 states that the Corps of Engineers shall complete the archeological survey of the areas to be impacted by the undertaking to identify the presence of archeological properties.

3. Previous Investigations. The first archeological investigations of the project area were carried out by Fred B. Kniffen in 1941. Kniffen recorded the Toups Place (16LF1), a Coles Creek-Plaquemine shell midden which lies approximately 7 miles southeast of the survey area. During the early 1950's, W.G. McIntire performed an extensive survey of coastal Louisiana which covered the project area (McIntire, 1958). McIntire's survey located and recorded over 500 sites. McIntire was primarily concerned with reconstructing the sequence of Holocene events using correlations between geomorphic features and initial occupation ages of Indian sites.

In 1974, McIntire conducted a survey for the proposed Louisiana Offshore Oil Port (LOOP) onshore pipeline corridor (McIntire, 1974, unpublished manuscript). In the vicinity of the LL&E (Louisiana Land Exploration Company) Farms, he reported the Bayou L'Ours site (16LF54) and the Bayou Raphael site (16LF88). Bayou L'Ours (16LF54) was reinvestigated by personnel of the Division of Archeology and Cultural Preservation, State of Louisiana subsequent to McIntire's LOOP survey. Limits of the site were flagged to avoid adverse impact from pipeline construction.

In 1975, Coastal Environments, Inc. performed a survey of archeological sites located adjacent to the Gulf Intracoastal Waterway in Louisiana (CEI, 1975). The survey reported a number of sites in the vicinity of the project area. The nearest site is 16LF36, an earth midden of Coles Creek era located approximately 1,000 feet northeast of Bayou Lafourche in the north bank of the GIWW.

The most recent archeological investigations in the study area have been cultural resources surveys of various portions of the Larose to Golden Meadow Hurricane Protection project. Between October 1977 and March 1978, Jon L. Gibson conducted a survey of the Clovelly Farms alternate levee alignment and the Louisiana Land and Exploration (LL&E) alternative levee alignments (Gibson, 1978). The survey utilized subsurface testing in areas of high site probability but located no cultural resources in the project right-of-way. However, two previously recorded sites, the Bayou L'Ours site (16LF54) and the Toups site (16LF1) adjacent to the project area were visited and insights into the area's culture history were offered.

Bert Rader, an archeologist with the U.S. Army Corps of Engineers, performed a survey of the Golden Meadow Floodgate in May 1978. (Rader, 1978) The survey located no cultural resources in the project right-of-way. In 1981, a cultural resources survey of Sections "F" and "A East" of the project was conducted by McIntire, et. al. (1981). The study included an intensive archival and field research program with special attention given to both modern and relic stream courses. The study report noted two previously recorded sites near the project, 16LF36 and 16LF76, and reported one previously unrecorded midden site, 16LF97, outside the project impact area.

In the vicinity of the Larose Floodgate, Stout and Muller (1983) located no in situ archeological remains. Seven relatively recent standing structures were recorded during the survey. None of these structures met the criteria for inclusion on the National Register of Historic Places. Stout and Muller did record a cultural resource of historical significance in the project impact area, the passenger vessel "M/V Fox." The M/V Fox was subsequently determined eligible for inclusion in the National Register as a result of a study done by R. Christopher Goodwin and Associates, Inc. (1984). Subsequently, the Historic American Engineering Record (HAER) documentation was completed by Goodwin and Associates in 1984.

A cultural resources survey of Section E-South was conducted by Ryan and Hicks (1984). The survey provided updated information on Site 16LF1, but located no cultural resources in the project right-of-way.

Additional information can be found in the Cultural Resources Appendix in the U.S. Army Corps of Engineers, New Orleans District document entitled Final Supplemental Environmental Impact Statement: Larose to Golden Meadow, Louisiana, Hurricane Protection Project (November 1984).

4. Description of the Study Area. The study area consists of five separate levee sections of the proposed Larose to Golden Meadow ring levee which has been investigated to date for the presence of cultural resources. Specific sections are depicted on the attached map. Surveys of these sections will complete all basic cultural resources survey work required for the western side of the ring levee which has a total length of approximately 20 miles (255 acres). The following table summarizes the construction schedule dates which will dictate the priority in which the specific sections will be surveyed for this delivery order:

<u>Section</u>	<u>Lift</u>	<u>Scheduled Award Date for Construction</u>
A West	Second	June 1986
B South	Second	June 1986
B North	Second	August 1988
C South	Second	June 1994
C North	First	October 1986

All the western levee segments except C North have previously undergone the first lift construction phase. As a result, the bulk of the project impacts have already occurred in these reaches. The additional impact of the second lifts is limited to the protected side edges of the existing borrow areas and a few isolated land remnants within the borrow areas. For this reason, the survey area for levee sections A West, B South, B North, and C South is defined as a 50-foot corridor adjacent to the protected side of the existing borrow areas and the land remnants within these borrow areas (approximately 90 acres). For Reach C North, the survey area is defined as the construction right-of-way less the existing levee (approximately 165 acres).

5. General Nature of the Work to be Performed. An intensive cultural resources survey of the project's potential construction impact areas will be performed. An intensive cultural resources survey is a comprehensive, systematic, and detailed physical examination for the purpose of locating cultural resources in the potential impact areas of the project. The potential impact areas include the physical alteration of the project right-of-way and the potential for adverse impacts on cultural resources. The survey will be conducted within the context of an explicit research design, formulated in recognition of prior work by NOD and others, and will include subsurface testing and evaluations of identified cultural properties against the criteria established in 36CFR60.4 for listing properties on the National Register of Historic Places.

Significance of identified resources will be evaluated within the framework of the historic context of the study area. The cultural resources survey will provide adequate information to seek determinations of eligibility

AD-A173 809

CULTURAL RESOURCES SURVEY OF THE WESTERN SECTIONS OF
THE LAROSE TO GOLDEN (U) GOODWIN (R CHRISTOPHER) AND
ASSOCIATES INC NEW ORLEANS LA E C POPLIN ET AL.

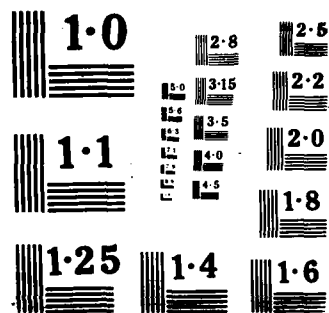
2/2

UNCLASSIFIED

18 SEP 86 COELMN/PD-86/14 DACM29-84-D-8829 F/G 3/6

NL

END
DATE
FILMED
1 87



from the Keeper of the National Register, and make recommendations for avoidance or mitigation of project effects on individual National Register and Register-eligible properties.

6. Study Requirements. The evaluation will be conducted utilizing current

- o the National Park Service's draft standards entitled, "How to Apply the National Register Criteria for Evaluation," dated June 1, 1982;
- o the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation as published in the Federal Register on September 29, 1983; professional standards and guidelines including, but not limited to:
 - o Louisiana's Comprehensive Archeological Plan dated October 1, 1983;
 - o The Advisory Council on Historic Preservation's regulations 36 CFR Part 800 entitled, "Protection of Historic and Cultural Properties", and Section 106, Update 3, entitled, "Manual of Mitigation Measures (MOMM)," dated October 12, 1982.

The work to be performed by the Contractor will be divided into three phases: Development of the Research Design, Intensive Survey, and Data Analysis and Report Preparation.

a. Phase 1: Development of the Research Design. The Contractor shall begin with preparation of a well-defined, problem-oriented research design. The research design should outline the historic setting of the study area and identify and define important data gaps and problems in our knowledge of the region's prehistory and history. The research design will include a statement of the general and specific theoretical goals in the form of hypotheses. Further, the research design will specify the data and techniques which will allow empirical testing of the hypotheses. Thus, the research design will integrate research objectives with specific data collection and analyses techniques, and will serve as the guide for evaluation of individual site significance.

The research design will be developed through historical research, review of records, and geomorphological analyses. The written report will specifically include the following as part of the research design:

(1) A brief description of the geomorphology, ecology, and cultural history of the study area as they pertain to the location, identification, and evaluation of cultural resources;

(2) A brief summary and evaluation of all previous archeological investigations in the project area in view of contemporary methodology and research objectives. Previous research will be summarized in terms of the theoretical framework employed and research problems investigated or identified;

(3) Identification of areas of high site probability, both prehistoric and historic, based on historic documentation, geomorphology, and settlement theories. The methodology and assumptions used in this exercise shall be fully explained;

(4) Refinement and full explanation of survey methodology with regard to field conditions and assumptions of high- and low-site probability areas. Maximum transect width shall not exceed 20 meters with shovel testing at 50 m intervals along transects.

The written draft research design shall be submitted to the Contracting Officer's Representative (COR) within 1.5 weeks after work item award for review and approval. All review comments will be resolved or incorporated within 2 days after submittal.

b. Phase 2: Intensive Survey. Upon approval of the Research Design by the COR, the Contractor shall initiate the fieldwork. The survey shall be an intensive pedestrian investigation augmented with systematic subsurface testing. State site forms will be completed and state-assigned site numbers will be utilized for all archeological sites located by the survey. All sites located in the survey corridors will be mapped, photographed, and tested using shovel, auger, and limited controlled surface collection to determine depth of deposit, site boundaries, stratigraphy, cultural association, and possible activity areas. Further test excavations to determine site significance within the context of the approved research design will be conducted at a maximum of two sites which the Contractor, in consultation with and approval by the COR, deems possibly eligible for inclusion in the National Register. Should the survey locate more than two sites which require further testing to determine eligibility, such testing is beyond the scope of this work item. Test excavations will include excavation of two or more 1m x 2m test units per site as necessary. All profiles and features excavated shall be mapped and photographed. Any pre-World War II standing structures located in the right-of-way will be recorded using state standing structure forms and a minimum of three clear black and white photographs. All such structures will be professionally evaluated to determine historical association and National Register eligibility. For structures located in the project right-of-way, the Contractor shall also address the archeological component of the site. A full assessment of the extent of previous adverse impacts to the unknown cultural resource base where first lift construction has been completed (all sections except Section C North) should be attempted through field investigations.

Upon completion of field work for Sections A West and B South, a management summary succinctly reporting the result of the survey shall be submitted to the COR within 4 weeks after work item award.

c. Phase 3: Data Analysis and Report Preparation. All survey data will be analyzed using currently acceptable scientific methodology. The Contractor shall catalog all artifacts, samples, specimens, photographs, drawings, etc., utilizing the format currently employed by the Louisiana Archeological Survey and Antiquities Commission. The catalog system will include site and provenience designations.

The Contractor shall expand upon the brief descriptions of geomorphology, ecology, and cultural history, as well as the summary of previous research presented in the Phase I draft report. This information shall be integrated with the research design, survey results, and laboratory analyses to produce a graphically illustrated, scientifically acceptable draft report. Project impacts on all cultural resources located by the survey will be assessed. All cultural resources located by the survey in the study area will be evaluated against the National Register criteria contained in Title 36 CFR Part 60.4 within the framework of the historic setting to determine eligibility for inclusion in the National Register. The Contractor shall provide justification of the criteria used and a detailed explanation of why, in his opinion, each resource does or does not meet the National Register criteria. For each resource recommended as eligible to the National Register and assessed to be impacted by the project, the Contractor shall evaluate and recommend mitigation alternatives. Inferential statements and conclusions will be supported by statistics where possible. Specific requirements for the draft report are contained in Section 6 of this Scope of Services.

7. Reports:

a. Phase 1, Research Design. Four copies of the report on the results of the Phase 1 investigations will be submitted to the COR within 1.5 weeks after work item award for review and approval. This report will summarize the results of the literature review and records search, and will present in detail the proposed research design.

b. Phase 2, Management Summary. Four copies of the management summary for sections A West and B South, one set of 7.5 minute quadrangle maps accurately delineating site locations, and one set of site forms and standing structure forms for all located cultural resources will be submitted to the COR within 3 weeks after work item award. The management summary will succinctly report the results of the survey, i.e. number, type, brief description, and assessment of project impacts for all cultural resources located and preliminary assessments of site significance. The summary report is not intended to be a lengthy interim report, but shall contain enough information to serve as a planning aid and a means of disseminating information immediately to the COR.

c. Draft and Final Reports (Phases 1, 2, & 3. Six copies of the draft report integrating all phases of this investigation will be submitted to the COR for review and comment within 8 weeks after work item award. Along with the draft reports, the Contractor shall submit one copy of support documentation for each cultural resource which the Contractor recommends as eligible for inclusion in the National Register of Historic Places. This documentation will follow the format and contain all the data required by the Guidelines for Level of Documentation appended to Title 36 CFR Part 63. The Contractor shall also provide recommendations for mitigation of each cultural resource recommended as eligible for the National Register. The written report shall follow the format set forth in MIL-STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) page size shall be 8-1/2 x 11 inches with a 1-1/2 inch binding margin and 1-inch margins; (3) the

reference format of American Antiquity will be used. Spelling shall be in accordance with the U.S. Government Printing Office Style Manual, dated January 1973. The body of the report shall generally include the following: (1) introduction-study area; (2) review and evaluation of previous archeological investigations; (3) prehistoric and historic overview of the Basin, environmental setting of the study area; (4) research design; (5) methodology, statement of project objectives, excavation strategy, implementation and effectiveness of methods; (6) data analysis and cultural material inventories; (7) data interpretation; (8) data integration; (9) conclusions; (10) recommendations; (11) references; (12) bibliography; and (13) appendices, if appropriate. The COR will provide all review comments to the Contractor within 5 weeks after receipt of the draft reports (13 weeks after work item award). Upon receipt of the review comments on the draft report, the Contractor shall incorporate or resolve all comments to the satisfaction of the COR and submit one reproducible master copy and 30 copies of the final report to the COR within 14 weeks after work item award (must be by September 8, 1986). Included as an appendix to the Final Report will be a complete and accurate listing of cultural material and associated documentation recovered and/or generated which the Principal Investigator considers worthy of preservation. In order to preclude vandalism, the draft and final report shall not contain specific locations of archeological sites. Site specific information, including one set of project maps accurately delineating site locations, site and standing structure forms, black and white photographs and maps, shall be included in an appendix separate from the Main Report. The Contractor shall submit 6 copies of this separate appendix with the draft reports, and one reproducible master copy and 30 copies with the Final Report.

DATE
FILMED
-8